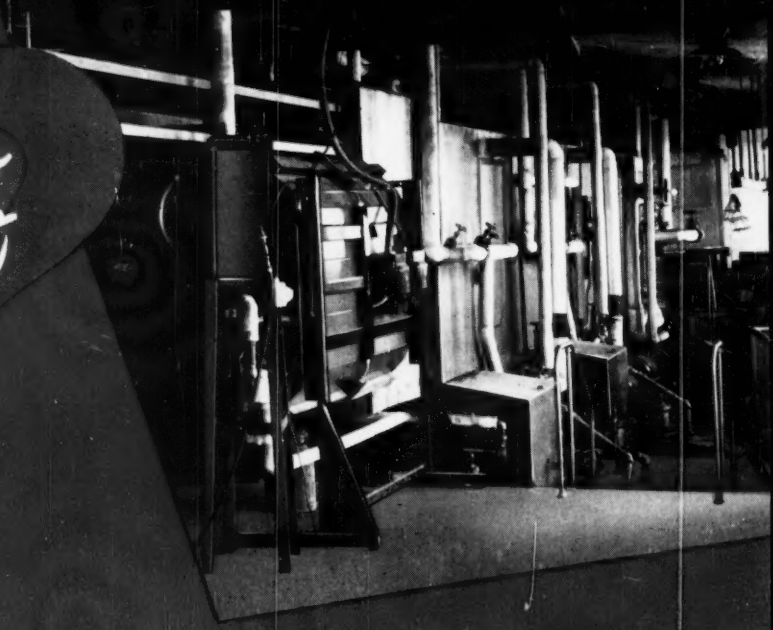
Products Finishing

CLEANING
PLATING
POLISHING
FINISHING

JULY 1950



Want to paint

- STEEL
- CAST IRON
- BRASS
- ALUMINUM
- STAINLESS
- MISCELLANEOUS

. . . for perfect finish,

Cincinnati PREPARES THE SURFACE

Installations include:

Chevrolet Motor Div., G.M.C.
Chrysler Corp.
Crosley Div., AVCO
Detroit Gear Corp.
Eastman Kodak Co.
Ford Motor Co.
Frigidaire Div., G.M.C.
International Harvester Co.
Mosler Safe Co.
Remington Rand

AN ESSENTIAL to good finishing is proper pre-finishing. Work to be painted must be thoroughly clean, dry and possibly phosphate-coated for good paint adhesion and prevention of rusting between operations.

The photo above shows a Cincinnati Conveyor Type Wash, Phosphatize and Chromic Acid Rinse Machine in use at the Excel Corporation, noted auto dash manufacturer, Elkhart, Indiana. The cycle set up by Cincinnati accomplishes the necessary pre-finishing in a minimum of operations, space and cost.

Your own pre-finishing operation may, of course, present a different problem. Cincinnati engineers plan for you the most economical methods . . . design the right equipment for the job.

New Cincinnati catalog now ready. Write for your copy.

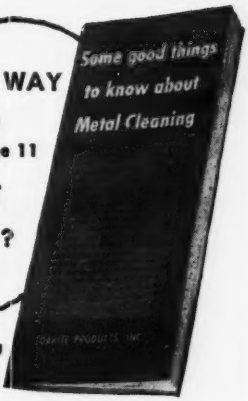
Cincinnati
CLEANING & FINISHING MACHINERY CO., INC.
IRONTON, OHIO

Oakite's New FREE Booklet

"Some good things to know about Metal Cleaning"

WHAT'S THE FASTEST WAY TO CLEAN METAL?
See page 11

WHAT'S THE MOST ECONOMICAL WAY?
See page 9



answers many questions that mean better production for you, more money in your pocket. You'll want to read more about:

Can one cleaning material do all metal-cleaning jobs? See page 5.

What kind of cleaner attracts both oil and water? How does this help to remove buffing compound residues and pigmented drawing compounds? See page 8.

What are the advantages of reverse current for electrocleaning steel? See page 15.

Can you electroclean brass without tarnishing? See page 18.

Can you clean steel and condition it for painting for less than 20 cents per 1,000 square feet? See page 26.

Would you like a cleaner that removes rust and oil in one operation, often eliminating all need for pickling. See page 28.

Does your burnishing barrel produce a luster you are proud of? See page 32.

FREE For a copy of this 44-page illustrated booklet, write Oakite Products, Inc., 20 Thames St., New York 6, N. Y.

Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

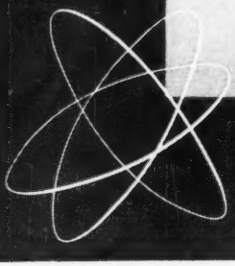
Palladium

PLATING SOLUTION

FOR ELECTRONIC APPLICATION

Ours is a self-sustaining solution, working from anodes. Gives excellent results in plating connectors, wave-guides and other electronic equipment where specified.

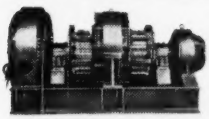
We make the anodes, too.



Baker & Co., Inc.

113 ASTOR ST., NEWARK 5, N. J.

New York • San Francisco • Chicago



Never gamble on low-voltage generators. For trouble-free commutation, it *does* pay to look for fully-insulated brush holders and rigging . . . for a copper pigtail bar to eliminate current passage through springs and fingers, thus lengthening brush life. And for optimum commutator efficiency, you want copper graphite brushes; moulded-in "equaload" shunts for equal distribution of brush loads and reduction of resistance. All these "musts" for economical, dependable operation are built into H-VW-M Low-Voltage Generators. Ask for Bulletin G-102.

You have an ace in the hole when you make H-VW-M your central source for all accessory items. You save time, money, effort. Such supplies as rubber gloves, aprons, earthenware crocks, dipping baskets, etc., are essential but often overlooked until your stock is dangerously low. H-VW-M carries hundreds of these "widgets" in stock. Each of them is specially made to meet the requirements of the plating and polishing industry; each conforms to H-VW-M's standards of highest quality.

You play it close to the chest when you specify Copper Graphite Brushes for your generators. This special material means maximum brush wear and life, insures highest conductivity along the path of the current. You play it safe, too, when you look for moulded-in shunts. Moulding-in keeps resistance at the minimum and when moulded-in "equaload" shunts are provided, selective action is eliminated, current distribution to the brushes is equalized. These plus factors, inherent in H-VW-M Copper Graphite Brushes, are described in Bulletin G-102.

And you always play it safe when you remember... you can always get what you want from H-VW-M when you want it . . . H-VW-M products are strategically warehoused for prompt service and delivery . . . H-VW-M sales-engineers and laboratory technicians are always available for help in your production problems. It is this overall service and experience that have made H-VW-M *the central source of supply . . . for over 80 years . . . for all the needs* of the electroplating and polishing industry.

HANSON-VAN WINKLE-MUNNING COMPANY, Matawan, N. J.
Plants at: Matawan, N. J. • Anderson, Indiana • *Sales Offices:* Anderson • Chicago • Cleveland • Dayton • Detroit • Grand Rapids Matawan • Milwaukee • New Haven • New York • Philadelphia Pittsburgh • Rochester • Springfield (Mass.) • Stratford (Conn.) • Utica

H-VW-M

SINCE 1920

6346

Manufacturers of a complete line of electroplating and polishing equipment and supplies

SHOW A NEAT FIGURE

IN SAVINGS ON

SOLVENT CONSUMPTION

BLAKESLEE

SOLVENT VAPOR DEGREASERS

Blakeslee Solvent Vapor Degreasers are engineered to give 100% oil-free jobs with *lowest solvent consumption*. YES, through patented construction and operational features, they actually USE LESS SOLVENT.

They're time-saving too. Metal parts are rendered chemically clean and dry in a few seconds, eliminating tie-ups and rejects in subsequent finishing operations.

Get the benefits of Blakeslee experience and superior performance in the Solvent Vapor Degreaser—engineered for you.

You add less solvent daily to Blakeslee Degreasers

G. S. BLAKESLEE & CO.

BLACOSOLV DEGREASERS AND SOLVENT

NIAGARA METAL PARTS WASHERS

G. S. BLAKESLEE CO., CHICAGO 50, ILLINOIS
NEW YORK, N. Y. TORONTO, ONT.

EZRA A. BLOUNT, *Editor*

ROBERT I. SHORE
Associate Editor

Consulting and Contributing Editors
H. LEROY BEAVER
ALLEN G. GRAY
BRYANT W. POCOCK

GENE J. SCHWARBER
Advertising Manager

NORMAN S. ROGERS
Art Director

A. J. WALKER
Circulation Manager

ADVERTISING REPRESENTATIVES

RICHARD S. KLINE
GEORGE E. HAY
431 Main St., Cincinnati 2
MAin 0182

G. M. FILLMORE
342 Madison Ave., New York 7
Murray Hill 7-7390

CHARLES H. DEILY, JR.
351 Mattison Ave., Ambler, Pa.
Ambler 0339

JOHN M. KRINGS
Tribune Tower, Chicago 11
DElaware 7-5441

THE ROBERT W. WALKER CO.
684 S. LaFayette Park Place
Los Angeles 5
DUnkirk 7-4388
69 Post Street, San Francisco 4
SUtter 1-5568

MEMBER

CCA NBP

Published monthly and copyrighted (1950) by

GARDNER PUBLICATIONS, INC.
431 Main St., Cincinnati 2, Ohio

Howard Campbell .....*President*
John M. Krings.....*Vice President*
Granville M. Fillmore...*Vice President*
Margaret Gardner Forney....*Secretary*
Richard S. Kline.....*Treasurer*

Printed in U. S. A.

Products finishing

Contents

Volume 14 JULY, 1950 Number 10

Liberty—Our Precious Heritage 11
Editorial

Diaphragm Tanks Promote Plating Progress .. 12
By Ezra A. Blount

Belt Polishing and Dip Finishing Door Chimes .. 28
By William R. Cutter

A.E.S. Boston Convention 40

Spotlighting Finishing Progress
By Dr. Allen G. Gray

—Factors Affecting the Adhesion of Organic Coatings 50

—Passivity in Chromium Plating Operations 70

Practical Applications of Modern Products

—Infra-Red Oven Removes Grease from Floor Furnace Parts 74

News of the Industry 78

New Equipment, Materials, Processes 86

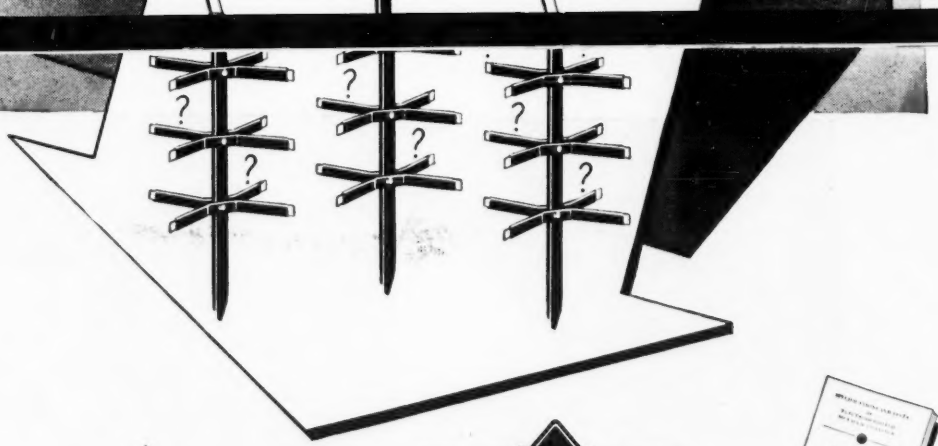
Opportunity Section 107

The Finishing Touch 108

Catalog Library 110

Index to Advertisements 112

Whatever goes in..
★HIGH QUALITY FINISH
★HIGH QUALITY SALTS
★HIGH QUALITY ANODES
must come out..



but how?

Only through the use of good operating technique and by adhering to approved specifications can the high quality of the raw materials be converted into the ultimate finish.

Vendors of plating supplies conscientiously maintain the high quality of their anodes, salts, chemicals, etc. Polishing methods are constantly being improved to prepare the basis metal for the deposit.

But . . . . it is only the plater himself who can insure that parts coming from the plating tank have a high quality, serviceable finish.

Send for your free copy of A.S.T.M.-A.E.S. SPECIFICATIONS AND TESTS FOR ELECTRODEPOSITED METALLIC COATINGS.

EMBLEM OF INCO SERVICE
TRADE MARK

The International Nickel Company, Inc.
Dept. PF, 67 Wall St., New York 5, N. Y.

Send me booklet entitled: "Specifications and Tests for Electrodeposited Metallic Coatings"

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET
NEW YORK 5, N.Y.

Picture frame handsomely finished in dark brown Claremont Flock —white sculptured horse is processed with contrasting tan and white Flock.

—Use CLAREMONT *Flock!* *industrially . . . decoratively*

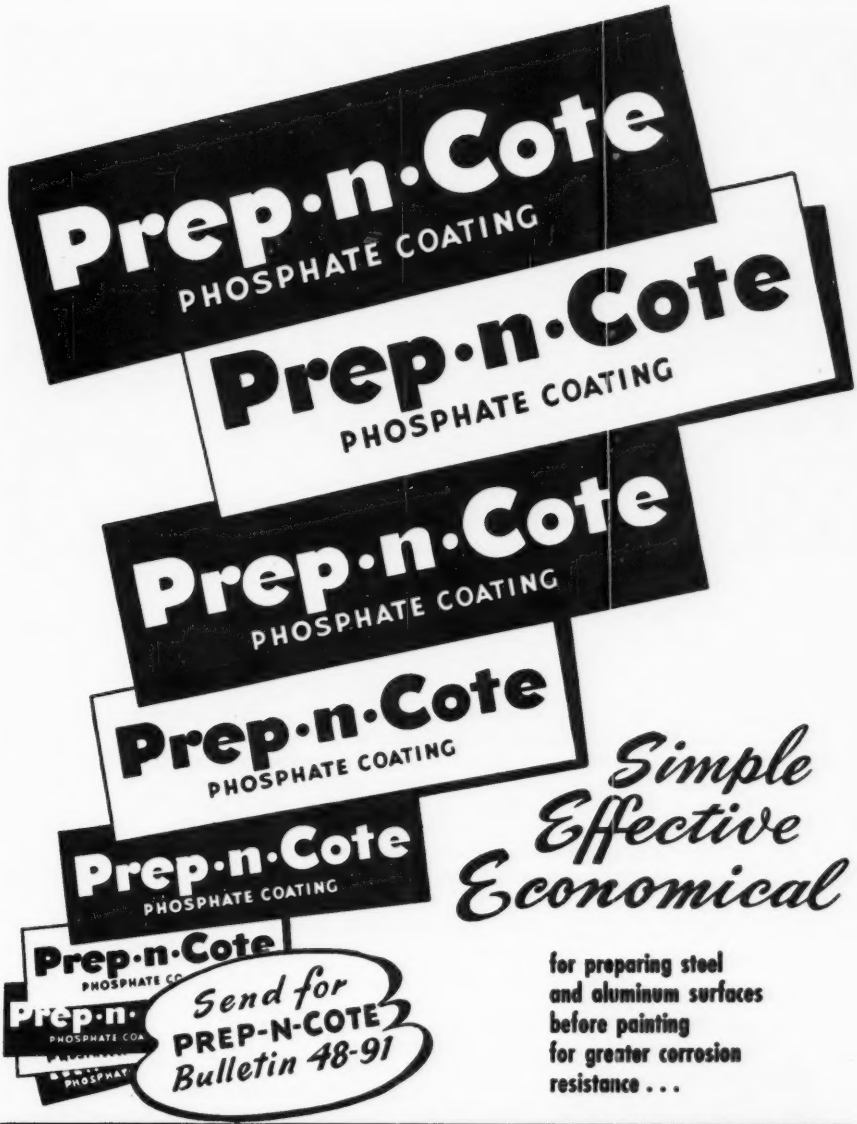
The above unique and life-like presentation indicates the industrial and decorative use-potential of Flock. For the finest in Flock, we invite you to contact Claremont.

Courtesy of Jann & Co., New York wholesale distributors.

INQUIRIES INVITED

Claremont Flock is available in bulk, in neutral shades and 18 rich colors, in quantity for special spraying-on finishing purposes. Write for samples, color charts, complete details and prices.

CLAREMONT WASTE MFG. CO.
CLAREMONT, NEW HAMPSHIRE



NEILSON CHEMICAL COMPANY

2682 Tecumseh Rd., Windsor, Ont. | 6561 BENSON ST., DETROIT 7, MICH. | 3411 Union Pacific Ave. Los Angeles 23, Calif.

"Buffing Compound Removal ~~is~~ was a Tough Job!!!"

● That's the title of the booklet describing in detail Cowles SO Cleaner—the remarkable new buffing compound remover *which really works.*

SO will effectively loosen the most stubborn, heavy, impacted, ground-in buffing compounds for subsequent removal in the electrolytic tanks. The latest developments in metal cleaning research have been incorporated in this new product. Its superior penetrating and wetting action quickly loosens dirt and impacted buffing compounds from *any metal.* SO can be used in still tank, fully and semi-automatic machines and is compatible with a wide range of temperatures. Because SO produces stable emulsions at low concentrations, it assures thorough rinsing.

COWLES CHEMICAL COMPANY
METAL CLEANER DEPARTMENT
7016 Euclid Avenue • Cleveland 3, Ohio

The Booklet gives you complete information—send for it today. The coupon is for your convenience.

COWLES CHEMICAL COMPANY
7016 Euclid Avenue
Cleveland 3, Ohio

Please send me your folder "Buffing Compound Removal ~~is~~ was a Tough Job!!!"

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

Pf editorial

Vol. 14, No. 10

JULY, 1950

LIBERTY---Our Precious Heritage

On July 4, 1776 a determined group of men composed a document which laid the foundation of our way of life. This document, which came to be known as the Declaration of Independence, can, with profit, be reviewed this month especially as a reminder not only of our personal indebtedness of the "founding fathers," but also as concrete evidence of our obligation to keep alive the spark of freedom, kindled by our forefathers.

One familiar passage from the Declaration of Independence is worthy of quotation:

> "We hold these truths to be self-evident, that all men are created equal; that they are endowed by their Creator with certain unalienable rights; that among these are life, liberty, and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed;—"

Thus were established the fundamental principles which later were enacted in the Constitution of the United States, and the "Bill of Rights," the first ten amendments to the Constitution. Upon these documents our individual freedom depends.

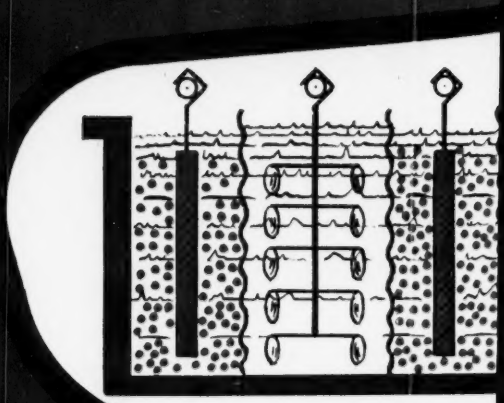
The closing sentence of the Declaration of Independence is notable:

> "And for the support of this declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our lives, our fortunes, and our sacred honor."

These men had a lot to lose, and a good chance of losing. So their pledge was not a light formality; it was made in dead earnest.

In our day there is a tendency to accept as a matter of course the blessings of liberty and freedom secured for us by our forebears. These comments are made with the thought that a personal rededication on the part of each and every one of us to the great principles expressed in the Declaration of Independence is very much in order. Only a sincere, personal devotion to the cause of freedom will preserve our principles of individual human rights.

Ezra A. Blount



Promote Plating Progress

During the past few years, a number of installations of diaphragm tanks to be used for the elimination of deposit roughness and improvement of deposit quality in high-speed cyanide copper plating solutions have been made. The same principle can also be applied with profit to other plating solutions such as silver, brass, zinc, cadmium, and particularly bright nickel. This article presents some of the considerations involved and points out the advantages to be gained.

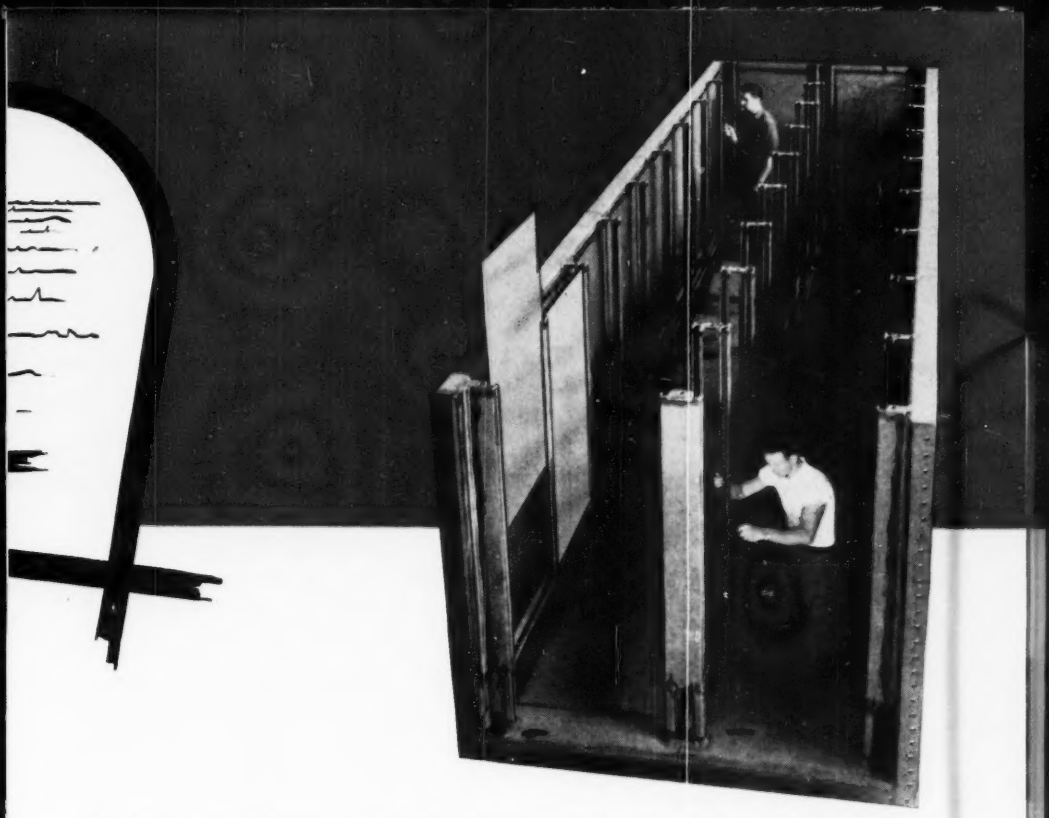
By EZRA A. BLOUNT
Editor

PF FEATURE

The possibilities and advantages of plating through a cloth diaphragm separating a plating tank into anode and cathode compartments have been mentioned in the literature as long as forty years ago, and some use has been made of this principle in silver plating and metal refining. The use of canvas duck diaphragms to separate a plating tank into anode and cathode compartments to eliminate roughness and aid the rapid production of a bright plate in high-speed copper solutions was again suggested by McCahan, MacKinnon, and Swalheim[1], of the Du Pont Company, at the 1948 Convention of the American Electroplaters' Society, held at Atlantic City, N. J. The plating industry has been quick to seize this new tool in order to profit by its advantages, and a number of installations have been made.

Causes of Roughness

Parts plated in copper plating solutions exhibit a certain amount of surface roughness, and that to a greater degree on the top side of horizontal surfaces. It is generally agreed that such roughness is caused by insoluble particles which settle on the work and become part of the deposit. Investigations have shown that such particles are formed at the copper anode, and are probably



metallic copper or copper oxide. Roughness can be reduced by slowing solution circulation, filtering more thoroughly, operating at lower current densities, and plating at higher free cyanide values, but none of these remedies (with the exception of filtering) permits the production of the required thickness of deposit in the given time cycle.

How the Diaphragm Tank Works

Application of the diaphragming principle to high-speed copper plating tanks has been accomplished by installing partitions, made of two layers of 11-ounce 36-inch wide canvas duck or other material for different processes, suitably mounted in frames, to separate the anode compartments from the cathode compartment or compartments. The illustration in the article heading shows how the diaphragms are installed in a plating tank. During plating operations the solution is pumped continuously from the anode compartments through a high-efficiency filter and back into the cathode compartment or work area as shown diagrammatically in Fig. 1. This action prevents any particles, less than a micron in size, formed at the anodes, from reaching the parts being plated. The solution must flow from the cathode chamber through the canvas diaphragm to the anode chamber. The increased solution circulation thus obtained will diminish the tendency of anodes to polarize and form insoluble particles, and permit higher current densities to be employed in either copper or nickel plating solutions, as well as eliminating any necessity for bagging of anodes.

Although in most installations the canvas diaphragm extends above the solution surface, so that the solution must flow through it, some installations

are designed so that the solution not only flows through the canvas but also overflows over the top of the frame into the anode compartment. This condition brings about a skimming effect which keeps the solution surface clean.

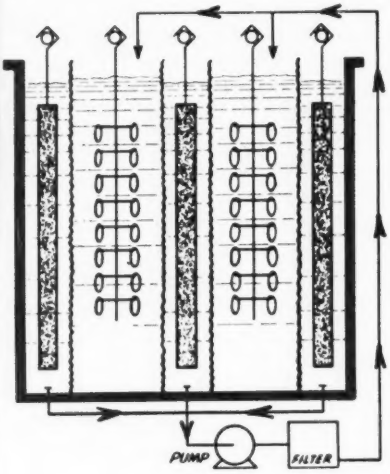


Fig. 1—Diagram illustrating how canvas diaphragms separate anode and cathode compartments in a plating tank and how solution is filtered and transferred.
(Illustration courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

This system has the further advantage of providing more complete, more efficient filtration and improved circulation of solution. Whether the solution turnover is three times per hour, once per hour, or once per day depends on local plating conditons. Filtering systems installed in plating tanks not separated into compartments, efficient and well-planned though they be, do not ensure complete solution turnover in each cycle. A much higher percentage of the entire volume of a solution can be filtered and circulated in each cycle by separating tanks into compartments, pumping solution from the anode chamber, filtering it, and returning it to the cathode chamber.

For extremely large tanks, an auxiliary filtration circuit can be used for the cathode chamber. The necessity for filtration of the catholyte depends upon local conditions, variations in the cleanliness of the product being plated, and changes in production volume. If an excessive amount of buffing dirt, for example, as well as other shop dirt, is continually dragged into the cathode compartment, then the solution in that compartment must be filtered continually, as well as the solution which flows into the anode chamber. When cleaning operations are thorough, it has been found even in moderately large installations that the separate filtration system for the catholyte need not be used at all times. However, it is advantageous to design an installation to include the two filtration systems and make provisions

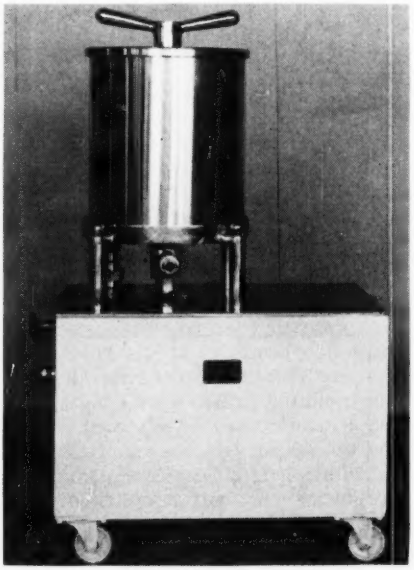


Fig. 2—The Ertel Model ECD stainless steel, cylinder type, disc filter features a double closure principle in that the filtering elements and cylinder are tightened independently.
(Photo courtesy Ertel Engineering Corp., Kingston, N. Y.)

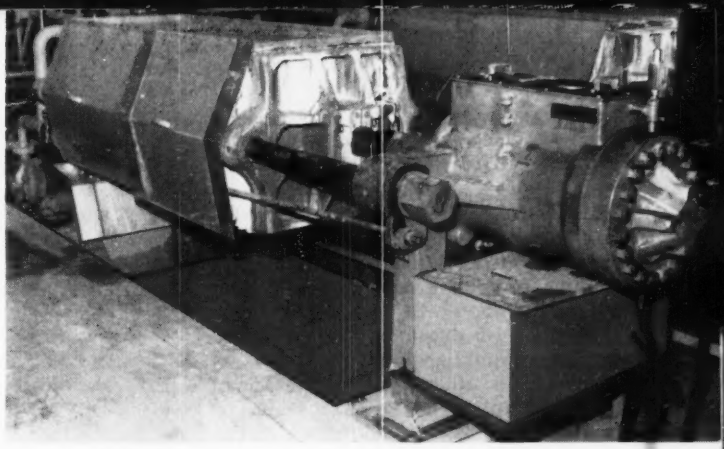


Fig. 3—A Sperry Type 41, 30-inch square plate and frame filter press, installed for continuous filtration of copper plating solution. The press contains 38 plates and 40 chambers, and features a hydraulic closing cylinder. (*PRODUCTS FINISHING Staff Photo*)

so that the filtration load can be shifted from one filter press to another (while one press is being cleaned), so that the solution from the anode chambers of the plating tank can be continuously pumped out, filtered, and returned to the cathode compartment free from contamination. Figures 2 to 6 show solution filters which can be used in this process.

Provisions making possible reversal of the direction of flow of solution are likewise useful in that the solution may be circulated in a reverse direction during extended "down" periods to make possible the removal and filtration of any slight film of sludge that may form in the cathode compartment and build up on the face of the canvas diaphragm. It is of even more importance to have available a storage tank for the copper solution so that the entire solution may be pumped out into the storage tank and the copper plating tank, together with the diaphragm screens, frames, and so on, washed thoroughly with water every two weeks or so, depending upon the volume of production.

Good practice directs that the solution removed from the anode compartment and filtered should be returned to the cathode compartment through longitudinal pipes located directly below the parts being plated. Holes drilled at an angle at intervals along the length of these pipes make possible the continual supplying of fresh filtered solution to the immediate vicinity of the plating surface. Pipes may be

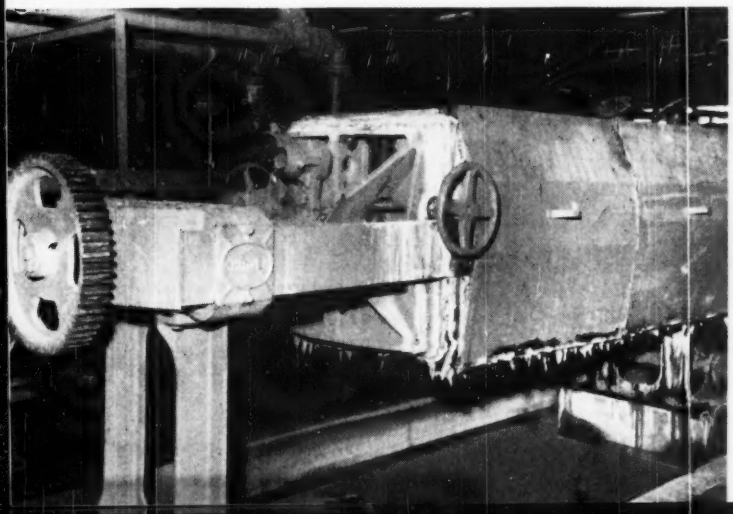


Fig. 4—This Shriver plate and frame filter press filters high-speed copper plating solution at the rate of 4,000 to 5,000 gallons per minute. In the left background may be seen a Duriron heat exchanger used to heat the plating solution. (*PRODUCTS FINISHING Staff Photo*)

rubber-covered and lined, or otherwise insulated as local conditions direct.

It has been found that exposed metals produce undissolved microscopic particles which cause roughness in electroplates. For this reason diaphragm plating tanks and all possible components, such as piping, filters, and so on, should be insulted.

Heating of diaphragm type tanks can be accomplished by heating coils mounted on tank sides in the anode compartment in the normal manner, or by heat exchangers through which the solution is circulated after it is removed from the anode compartment and filtered. Figures 7 to 11 show various means of heating the plating solution. Automatic temperature controls can be installed in the usual manner, the exact details of installation depending upon the heating system in use and other local factors. Figure 12 is a view of a plating room, showing automatic temperature controls installed.

If it is not considered desirable to employ heat exchangers and if space for mounting heating coils is not available in the plating tank proper, heating coils may be mounted in a supply tank through which the solution is circulated and heated. There are two ways to design such a system. In one design the solution could be pumped from the plating tank, filtered, and delivered to the supply tank containing the heating coils. The supply tank could be so located that the solution would flow by gravity from the supply tank back to the plating tank. An alternate arrangement could be designed so that the solution from the plating tank would flow by gravity to a storage tank, at which point it would

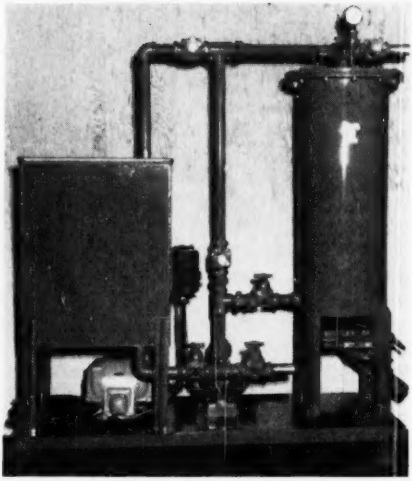


Fig. 6—This Titeflex plating solution filter, designated as Model SA-1000, is constructed throughout of Type 316 stainless steel.
(Photo courtesy Titeflex, Inc., Newark 5, N. J.)

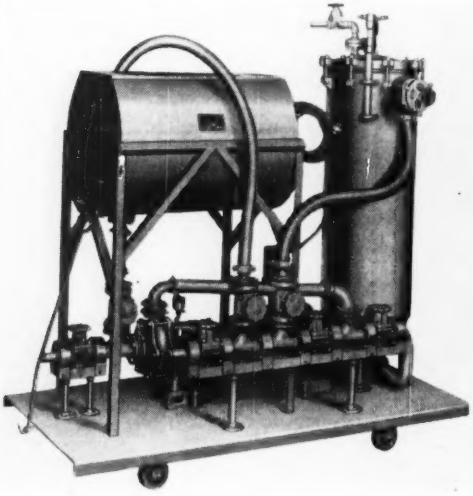


Fig. 5—Here illustrated is the standard 2,000 gallon per hour nickel solution filter supplied by Industrial Filter & Pump Mfg. Company.
(Photo courtesy Industrial Filter & Pump Mfg. Co., Chicago 12, Ill.)

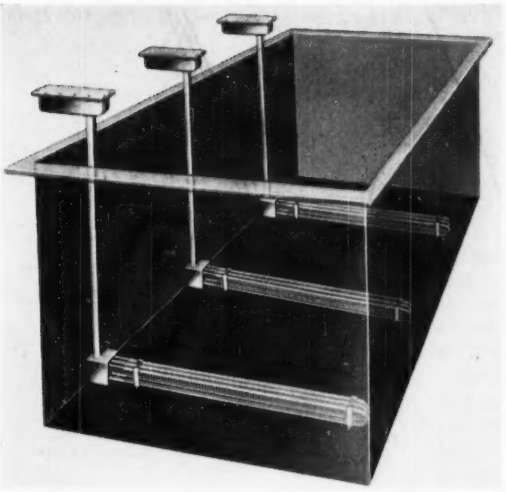


Fig. 7—Chromolox electric portable tank immersion heaters may be installed in plating tanks or storage tanks to heat plating solutions. *(Photo courtesy Edwin L. Wiegand Co., Pittsburgh 8, Pa.)*

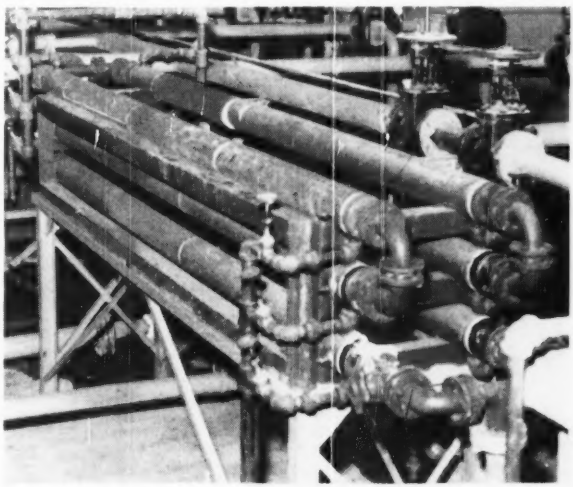
●

be heated. Leaving the storage tank, the solution would be pumped through a filter and then back to the plating tank. This design has one disadvantage in that, as the hot solution passes through the filter, a considerable amount of heat is disseminated into the plating room.

Figures 13 to 15 show typical rubber-lined steel tanks for use with high-speed copper plating solutions. The exact design of the two installations varies due to minor differences in the circulation system. As can be noted, the diaphrams supported on rubber - covered steel frames have not been placed in these tanks but are designed to slide down the channels which may be seen at the tank sides and in the tank centers.

As can be noted in the accompanying photographs, the tanks have been designed and manufactured in sections, limited generally in size to that size which can be handled and transported readily. Sections are assembled into the completed tank in the plant where the plating installation is being made. Larger installations could be manufactured or assembled and lined in the customer's plant.

The tank bottoms are sloped from each end (of each section) to a sump running cross-wise to the length of the tank. The fall is nominal; in the tanks pictured it is 3 inches in 12.5 feet. In the sump is located a pipe



●

Rig. 8—A Duriron steel tube heat exchanger used to heat high-speed copper plating solutions. *(PRODUCTS FINISHING Staff Photo)*

which is connected to each anode chamber for removal of solution to the filter. In the same sump a pipe open to the cathode compartments is placed. This pipe may be used for pumping out catholyte, or it may serve as the means by which the solution removed from the anode chamber and filtered may be returned to the plating tank.

Whether or not rubber-covered steel protectors or guards should be hung in front of each diaphragm depends entirely on local conditions and the parts being processed. If the situation is such that the diaphragm may be damaged by sharp projecting edges of the parts being plated, then properly designed guards are in order. If the distance of the work from the diaphragm is such that the likelihood of contact is remote, and if other conditions of operation make this possibility unlikely, then guards need not be used.

Under certain conditions it is difficult to keep such a large section of canvas from sagging or "bellying" in the solution. This condition is more likely to occur when the filter unit is "packed" or coated with one of the "filter aid" materials. Narrow diaphragm frames minimize this condition, which, if allowed to continue, invites damage to the canvas separator, and resulting defective plated work. The sagging or "bellying" of the canvas may be prevented by adding a protective, rubber-covered steel frame to each diaphragm unit. The frames not only prevent sagging, but protect the canvas against damage.

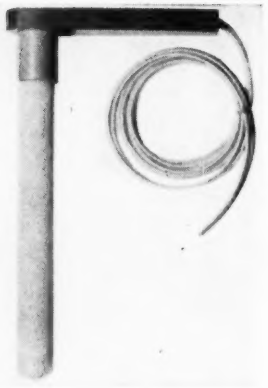


Fig. 10 — Amersil corrosion-resistant, electric immersion heater for electroplating solutions. *(Photo courtesy Amersil Co., Inc., East Newark, N. J.)*

The useful life of the canvas diaphragms is literally a matter of months and years. There is a tendency for the canvas to break down at the

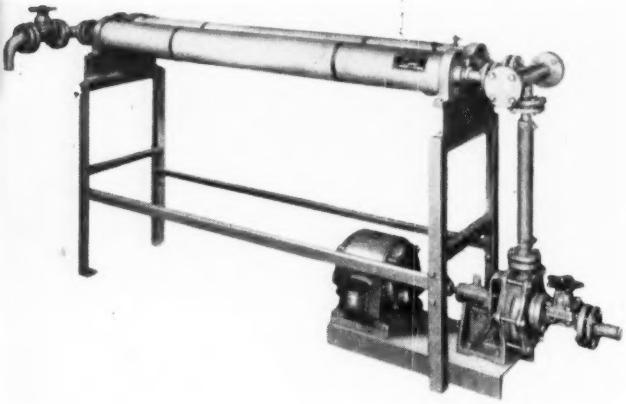


Fig. 9 — Illustration shows a heat exchanger, used for heating nickel plating solutions, which features nickel tubes properly insulated against any stray currents so as to avoid corrosion of the heat exchanger tubes. *(Photo courtesy Industrial Filter & Pump Mfg. Co., Chicago 12, Ill.)*

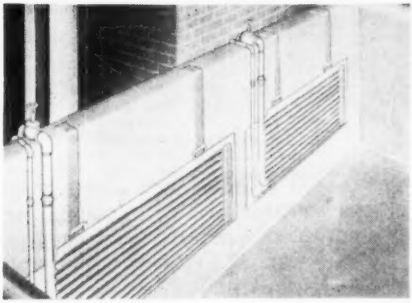


Fig. 11—The flat design of Platecoils, heating and cooling coils formed from sheet steel and assembly-welded, makes these products adaptable for installation in diaphragm plating tanks, where steam is used as the heating medium.
(Photo courtesy Platecoil Div., Kold-Hold Mfg. Co., Lansing 4, Mich.)

solution level, but that difficulty can be overcome by coating the upper 6 or 8 inches of the canvas with one of the compounds, such as Bunatol, being used for insulating plating racks. Some users cut holes in the canvas near the solution level, but that practice is not recommended since it weakens the sheet. The life of the duck separators may be further increased, particularly as their use is extended to other plating solutions, by the development and adoption of new materials such as Nylon, Vinyon, and so on. However, cotton fibers are fuzzier and not as smooth as synthetic fibers. Therefore, the cotton materials provide a better filtering medium. It may be found further that different solutions may require a different mesh opening than that heretofore regarded as standard.

Application of the Diaphragm Principle to Bright Nickel Solutions

As nickel anodes corrode, small particles of sludge are formed, as is the case in most plating solutions. For more than 20 years anode bags of various kinds have been used to collect the particles of sludge and thus prevent them from migrating to the work being plated and producing a rough deposit. As all who have used anode bags can testify, removal of the anode and bag from the solution causes a certain amount of sludge to enter the plating solution. The neces-

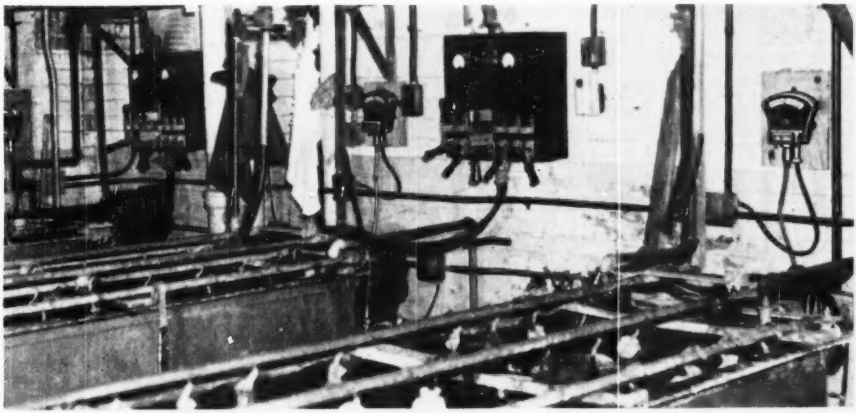


Fig. 12—Here illustrated is a plating installation in which the temperatures of chromium, cyanide copper, nickel, and silver are automatically controlled by Sarco Type LSI electric dial thermometer-thermostats. Each thermostat operates a solenoid valve on the steam supply to tank heating equipment.
(Photo courtesy Sarco Co., Inc., New York 1, N. Y.)

Fig. 13—A view of one section of a rubber-lined tank designed with provisions for diaphragms and specified for use with a high-speed copper plating solution.
(Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

sary periodic removal of anodes to install new anode bags or replace worn-out anodes with new ones is a troublesome and expensive process. Diaphragm type plating tanks merely extend the anode bag idea so that the anodes are now enclosed in large compartments, making possible improved anode corrosion, increased solution flow past the anode, and more rapid plating through the use of higher current densities. Most large bright nickel plating installations are equipped with circulation systems employing pumps, filters, heat exchangers, and electrolytic purification tanks, so that the idea of modifying the tank design slightly to substitute canvas diaphragms for the conventional anode bags represents no drastic departure from normal practice but rather a very logical development of current practice.

More efficient solution circulation and filtration may be accomplished with this system, and hence a cleaner solution will result. This is a very definite contribution to improved quality of deposit. A considerable advantage lies in the possibility of making

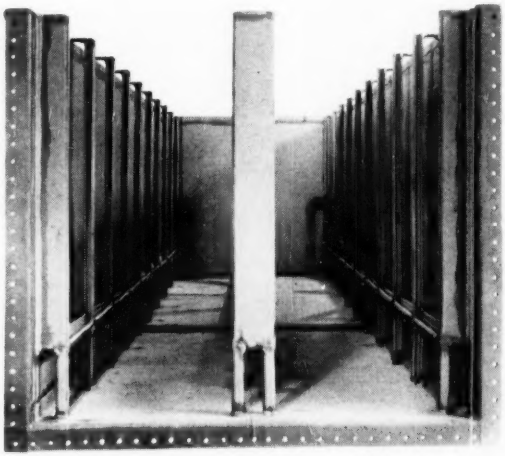


Fig. 14—In this view of the completed tank section shown in the article heading, it can be noted that the diaphragms do not extend all the way to the bottom of the tank. A drain channel has been installed paralleling the tank bottom so that the solution from the anode compartment may be removed, filtered, and returned to the tank in the usual manner.
(Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

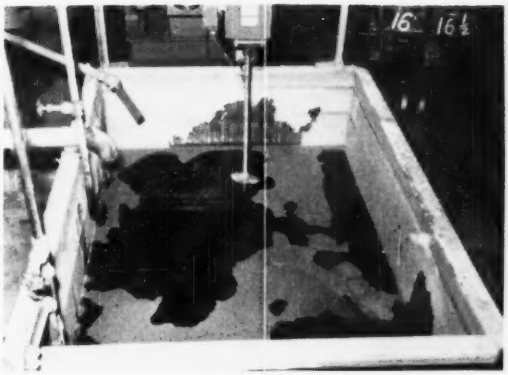


Fig. 16 — A solution mixing tank, such as the one illustrated equipped with an Alsop motor-driven stirrer, is a valuable element of a diaphragm tank plating installation. Chemical additions, completely dissolved, can be fed into the system in small increments ahead of the filter and heating device, and thus delivered to the cathode compartment free from particles and at the proper temperature.
(PRODUCTS FINISHING Staff Photo)

brightener additions as well as other additions to the plating solution in the anode compartment or in the circulation system to eliminate the possibility of trouble caused by large chemical additions directly to the plating solution during periods of production. Thus, wetting agents or brighteners intended for the entire solution may be distributed gradually through the solution, whereas if these chemicals must be added directly to the catholyte, there is considerable time in which their concentration in the actual plating area is far in excess of that intended.

During the course of plating development, and particularly bright nickel plating, allowable current densities have been increased steadily. At the present time current densities varying between 60 amps./sq. ft. and 100 amps./sq. ft. produce excellent deposits. It has been shown that by increasing the rate of solution flow and establishing other special conditions nickel can be plated at a current density in excess of 4,000 amps./sq. ft. At the present time experiments show that the day is not far off when nickel can be plated commercially at 400 to 500 amps./sq. ft. Since one important

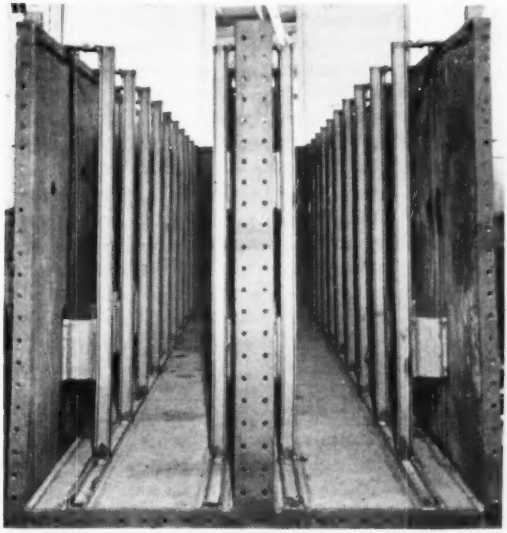


Fig. 15—A view of the completed tank section shown in Fig. 13. As can be noted, the channels into which the diaphragm-covered frames are placed extend completely to the bottom of the plating tank. As described in the article, the tank bottom slopes toward a central sump to facilitate the proper flow of solution, as well as periodic washing and tank cleaning operations.
(Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

consideration in this plating progress moving toward higher current densities, producing the normal nickel deposits in shorter times, is increased solution circulation, the need to adapt nickel plating tanks for use with canvas diaphragms becomes increasingly important. As plating speeds increase as the result of normal research and development, separation of anode and cathode compartments by canvas diaphragms, or diaphragms of some sort, will become a "must" in the industry.

Conversion of Existing Equipment

While it is highly desirable that tanks to be used with canvas diaphragms be specially designed and properly lined, in order to secure the optimum results from the employment of the process, it is possible to convert existing plating facilities to take advantage of the diaphragming technique. This possibility will assist the smaller manufacturers and job plating shops who are not able to undertake a major conversion program. This possibility should be of particular interest to job shops whose future success depends on increased attention to quality and control of the plating operation. Lack of attention to these matters has been responsible for the establishment of major manufacturers of their own plating facilities.

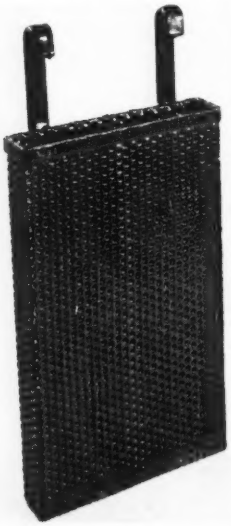


Fig. 17—A rubber-covered steel anode basket similar to the one here illustrated can be covered with canvas and thus converted into an anode compartment so that the advantages of diaphragm tank operation can be secured. (*Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.*)

To convert plating tanks already in operation so that diaphragms may be employed, the only requirement is that the tanks be sufficiently wide that there is adequate space in the tank for the movement of the work in and out of the solution and through the solution. Considering that anode bags are in a sense small, individual diaphragms, an intermediate step between the anode bag and the separate anode compartment is the employment of an anode basket, such as that shown in Fig. 17, which is constructed of rubber-covered steel only wide enough to allow free movement of the anodes as they are placed in the basket or removed therefrom, and as long as practical considerations for the tank in question dictate. The same heavy canvas material used in the other installations is sewed to form a fitted bag into which the anode basket is forced. The anode basket assembly should be large enough to include from four to six anodes or more.

For installations of this type, each anode basket assembly must be connected to a manifold by any one of a number of methods, the simplest being merely the employment of rubber hoses. The main collecting manifold is connected to a pump and filter in the usual manner, and the filtered solution may then be returned to the plating tank in any one of the methods previously described. Some designs in which the anolyte is removed from the bottom of the plating tank specify that the filtered solution be returned to the

Fig. 18—Large plating tanks can be converted to diaphragm tank operation through the use of a series of anode baskets, such as the one here illustrated, together with proper canvas bag coverings and the usual pumps, filters, and other auxiliary equipment.
(Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

top of the tank to secure more perfect circulation. In installations employing anode baskets covered with canvas, if the solution is removed from the anode compartment from a point near the top of the solution, it would seem preferable to return the filtered solution to the bottom of the plating tank, perhaps at a point directly below the work being plated. All the other considerations and possibilities for the designed installations apply in the case of operating tanks converted to this procedure without interruption to production.

Anode baskets such as the one shown in Fig. 18 can be covered with canvas and joined together in a series through the use of the two pipe fittings mounted on each end of the bottom of the frame. Thus, the entire bank of anode compartments may be connected to the pump manifold at one joint, and a neater installation will result. Since such a setup removes solution near the tank bottom, the filtered solution can be returned at a point near the tank surface.

Shown in Figs. 19 and 20 are views of a simple, practical system whereby small plating tanks can be transformed into compartmented tanks. For such installations, the diaphragm assembly is made to fit the tank rather closely and held in position by steel spacers, sheet rubber seals, as well as by bolts through the tank flange. The assembly consists of an outer protecting frame, with large openings on the anode side and smaller openings on the work or cathode side, into which the frame containing the canvas 2-ply diaphragm can be slipped. A filter of suitable size, with intake and discharge hoses, completes the installation.

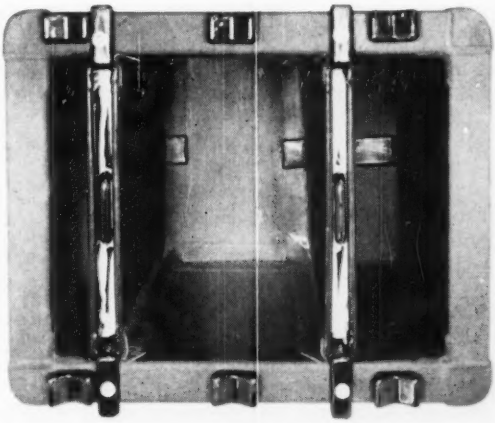


Fig. 19—Illustration shows the way in which a small rubber-lined plating tank can be converted to diaphragm tank operation. This illustration shows in detail the sheet rubber seals used around the edges of the diaphragm screens and the steel rubber-covered spacers used to hold the screens solidly in position.
(Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

The advantages to be gained from the elimination of rough particles in deposits of a decorative nature are quite obvious. For instance, when rough particles are removed from copper by buffing, part of the metal is pulled off, leaving holes in the deposit. These serve as focal points for corro-

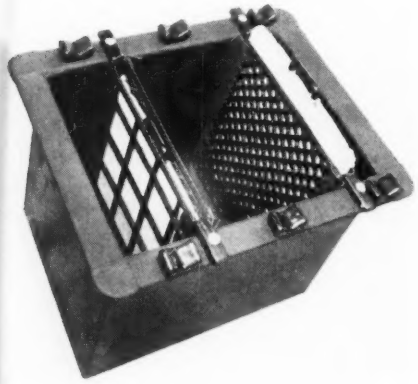


Fig. 20—Another view of the small plating tank converted to diaphragm operation showing that the protecting screens immediately adjacent to the anodes may have much larger mesh than the screens adjacent to the cathode chamber.
(Photo courtesy Automotive Rubber Co., Inc., Detroit 4, Mich.)

sion, which is not slow to start under such conditions. Also, the actual buffing of rough plate causes undue wear on buffing wheels and abnormal consumption of buffing compounds, as well as buffing time.

For the field of plating in which articles are plated not primarily for decorative purposes but to prevent corrosion, the advantages to be gained through solution purification and the removal of insoluble impurities may not be quite so obvious. Imperfect or non-uniform deposits, however, such as those containing foreign particles deposited with the plated metal, may tend to corrode faster and offer less satisfactory corrosion resistance than would normally be expected.

With reference to diaphragming design-methods, it would not be amiss to acknowledge the cumulative efforts of Automotive Rubber Company, Inc., who, in cooperation with its customers and in some cases equipment manufacturers, has provided a dozen or more practical methods of installing rubberized structures for supporting the canvas duck membranes. Officials of Automotive Rubber would like to acknowledge the assistance rendered by Martvig M. Moll, Arthur H. Friedman of the Hanson-Van Winkle-Munning Company, Leon Pionowski of the Udylite Corporation, and Maurice Caldwell of the Doehler-Jarvis Corp.

Manufacturers of plating tanks, and tank lining specialists stand ready to assist the plating industry in extending the application of the principle of circulating plating solutions from an anode compartment through a filter to a cathode compartment, to those solutions for which it is not now being generally used. The resulting increase in plating efficiency and quality of deposit, as well as the reduction in plating cost, will more than offset the cost of the additional equipment in the form of tank diaphragms, anode baskets, pumps, filters, and so on, which the process requires. The succesful use of the process, particularly with regard to high-speed copper plating, is a matter of record. All that remains is for more platers to benefit from the advantages to be gained through the extension of this same principle to other solutions and installations.

---

[1] Diaphragm Tanks to Eliminate Roughness in Copper Plating, R. H. McCahan, C. E. MacKinnon, D. A. Swalheim, Proceedings 35th Annual Convention, American Electroplaters' Society, 1948.

ACKNOWLEDGMENT

The author acknowledges with thanks the assistance of the following individuals in the preparation of this article:
Robert L. Redmond and William C. Enright, Automotive Rubber Company, Detroit, Mich. F. L. Clifton, General Motors Research Corp., Detroit, Michigan. Fred G. Brune, Marion Industries Div., Motor Products Corp., Marion, O.

In the modern NUTONE plant

...6 DIFFERENT INSTALLATIONS By KIRK AND BLUM!

- 2 DUST CONTROL SYSTEMS
- DEGREASING AND ACID ETCHING VENTILATION
- PAINT SPRAY BOOTHS (INSTALLED ONLY)
- PAINT DRYING OVEN AND CONVEYOR
- MAKE-UP AIR SUPPLY SYSTEM

A variety of problems in the Finishing Departments of NuTone Incorporated, were solved by KIRK & BLUM Engineers. Shown here are the various installations which were designed, fabricated and installed by KIRK & BLUM.

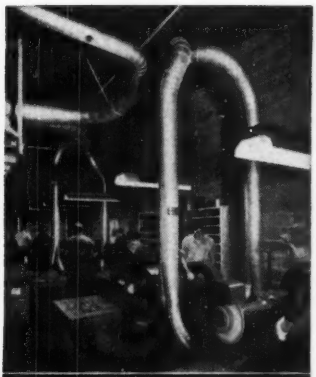
Of special importance is the "Make-up" Air Supply System which filters, heats and replaces air exhausted by the other systems, eliminating undesirable winter drafts.

The wide experience of the KIRK & BLUM organization is at your service. "Clean Air . . . the Invisible Tool" can do much to increase the efficiency of your operations. For more details and literature, write The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati 25, Ohio.

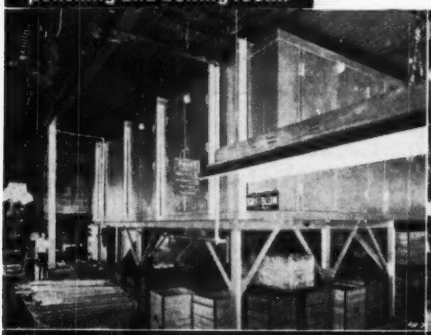
FOR CLEAN AIR . . . THE INVISIBLE TOOL

KIRK AND BLUM

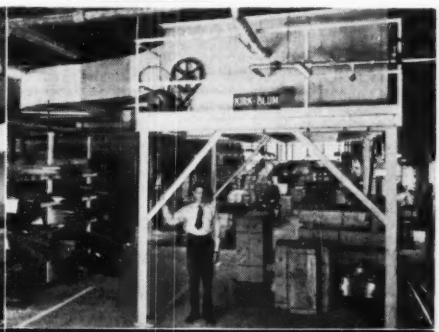
DUST AND FUME CONTROL SYSTEMS
INDUSTRIAL OVENS



Two KIRK & BLUM Dust Control Systems serve the polishing and buffing room.



Overhead conveyorized Paint Drying Oven installed complete by KIRK & BLUM.



"Make-up" air supply system replaces air exhausted from plant.

save time and

TOUCH-UP WORK

PLANT MAINTENANCE

The only paint spray unit that gives you 1 horsepower performance at ⅓ H.P. cost

* 8 spray gun combinations are available for Binks DP unit

powerful	Compact ⅓ h.p., a-c motor with ball bearings... for 110-120 volts, a-c. Gives 1 horsepower paint spray performance.
safe	No exposed moving parts. Counterbalanced piston (1725 strokes per minute) is directly driven from motor. With safety overload cut-out.
pulsation chamber	Gives smooth, unbroken air-flow at 40 lbs. pressure. No piston surge. Traps water, oil, dust from the air.

EVERYTHING FOR SPRAY PAINTING

BINKS SPRAY SYSTEMS

NEW YORK • DETROIT • LOS ANGELES • ATLANTA • BOSTON • CLEVELAND • DALLAS

money WITH A BINKS DP* PORTABLE SPRAY PAINTING UNIT

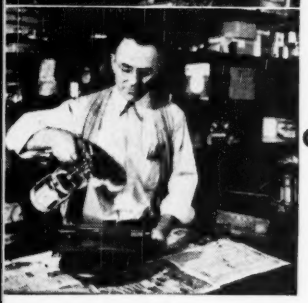
SMALL PARTS FINISHING

DUSTING AND CLEANING

*DP means Direct-drive Piston

A

B



C

You pick up this powerful 47 lb. Binks DP portable spray painting unit and take it straight to the job. Just plug it in* and you are ready to go to work. You can use it to touch up damaged finishes...to do painting that would require moving items back to the finishing department.

You can use the DP unit on the assembly line...out on the plant floor...in the shipping room...anywhere there's a paint job to be done. You know that it will do the job fast, well, and economically.

By actual test, this ⅓ horsepower Binks DP portable spray painting unit applies coatings with the same speed and quality as a full horsepower outfit...for only a small fraction of the cost. It will operate hour after hour in hard, continuous use.

*Also available for operation with ¾ h.p. gasoline engine.

A touch-up work
Touch up rejects or damaged finishes right on the assembly line or anywhere in the plant. Plenty of pressure for air cleaning with Binks Models 150 or 190 Blow Guns.

B plant maintenance
A big time and money saver in maintenance work. The complete portability of the Binks DP unit permits taking it to any job. Indispensable for routine repairs.

C small parts finishing
Ideal for small parts, light spray finishing, and odd jobs. Handles regular production loads in small plants. Sprays metallics, enamels, lacquers, shellacs, house paint, etc.

"The Binks DP unit is just one of the many Binks developments designed to make finishing easier and more economical for you."

J. L. Roche
Chairman of the Board

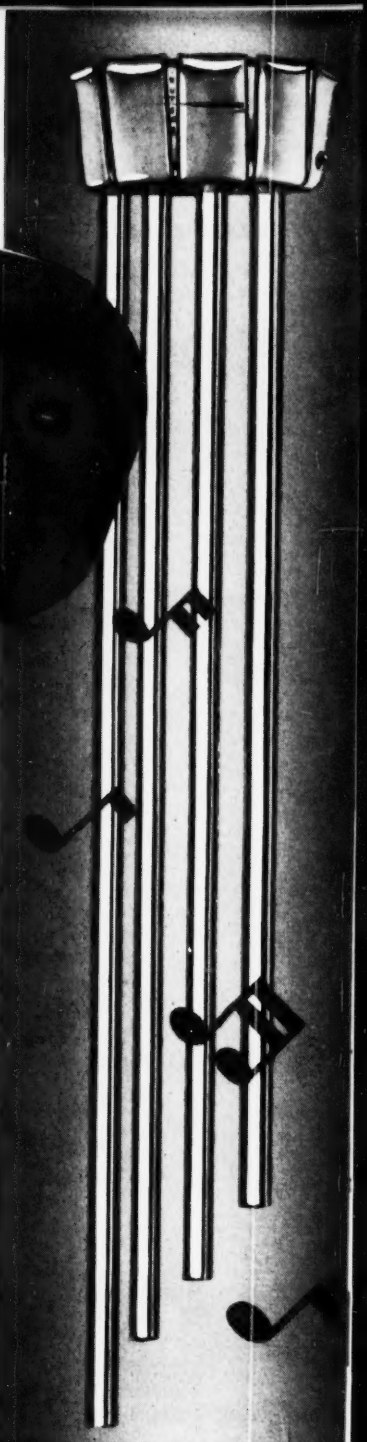
Send today for your free copy of the illustrated Bulletin 601 which describes fully the DP unit and also spray gun combinations for use with it.

Binks MANUFACTURING COMPANY

3118-40 Carroll Avenue, Chicago 12, Ill.

MILWAUKEE • NASHVILLE • PHILADELPHIA • PITTSBURGH • ST. LOUIS • SAN FRANCISCO • SEATTLE • WINDSOR, ONTARIO, CANADA

Belt Punching, Dip Finishing Door Chimes



By **WILLIAM R. CUTTER**
Production Manager
NuTone, Incorporated

NUTONE, Incorporated, founded in 1937 by Ralph J. Corbett, has experienced a rapid and continual growth, expanding from a second-floor room to the present new, modern plant in 13 years. As evidence of the continual growth of the company, although the present plant has been occupied only since September 1949, a new, 26,000 sq. ft. addition is now in process of construction.

Products manufactured by this aggressive, alert organization include chiming clocks, door chimes, ventilators, transformers, push buttons, door knockers, and illuminated house numbers. The chime tubes, basic elements of the products most closely identified with the name of the company, are made from various lengths and diameters of seamless brass tubing. Tubes 1½ inches in diameter are usually 12 inches in length; 1-inch diameter tubes vary in length from 24 to 57½ inches; 1⅛-inch diameter tubes vary from 34 to 59 inches in length. Since critical inspection standards require a tolerance of only plus or minus 1/64 inch in length of tubes to secure the proper tone in the chimes, most of the tubes are purchased, cut to the specified length. For tubes

Finishing operations in the new, 100,000 sq. ft. plant of NuTone, Incorporated, are conducted in a completely conveyorized, pressurized, air-conditioned finishing unit, complete with water-wash spray booths, dipping tanks, and circulating-air, overhead oven. Air removal from polishing and buffing operations prior to organic finishing is more than adequate, to ensure plant cleanliness and employee comfort.

purchased in lengths other than normal chime length, the first operation of manufacture is that of cutting them to the proper length. For some door chime models chime tubes designed to act as resonating chambers are manufactured from sheet stock, by blanking and forming. Such tubes magnify the sound produced by the variations of a steel reed; the other chime tubes are sound media in themselves.

The first finishing operation performed on chime tubes is that of abrasive belt polishing. A battery of four Production Type "S" Centerless Polishing Machines, equipped with 4 x 60-inch 3-M-ite O.D. grinder and polisher belts, is utilized to handle the job of polishing the seamless tubing, cut to chime length. In polishing, the tubes receive two to four cuts or passes through the polishing machine for each step in the cycle. After the first pass, the tubes are turned end for end so that the second pass removes any polishing marks left from the first operation. The usual polishing cycle consists of an operation with a 150-emery belt and a final pass through a machine equipped with a 220-emery abrasive belt. For other purposes, the final operation may entail polishing with a 320-emery abrasive belt, or, for a very soft satin finish, a third step of polishing with a 500-emery abrasive belt, lubricated with Buckeye Products Grease Stick, may be added. Belt speed on the machines is usually from 7500 to 8500 surface feet per minute, and tube production averages around 200 tubes per hour—taking into consideration the various tubing lengths handled in production. Figures 1, 2, and 3 are views of the polishing operation.

Polishing belts can be replaced when necessary without stopping the polishing machines, and changeover time requires less than 30 seconds, thus making for an almost continuous polishing cycle with practically no down time. Dust resulting from polishing operations conducted on these machines is removed by a Kirk & Blum Cyclone Dust Collector, mounted on

Fig. 1 — Operator feeds long chime tubes through centerless polishing machine equipped with 150 emery abrasive belt. At the right against the wall may be seen the exhaust duct through which dust from the polishing operation is removed. Note: Photograph was taken with polishing machine guard open to show mounting and location of the polishing belt.

Fig. 2—Illustration shows the contrast between the dull surface of two seamless brass tubes and the bright, polished surface of similar tubes after the polishing operations herein described.

the factory roof, which has sufficient capacity that 750 cu. ft. of air per minute are exhausted from each machine, through a 3-inch diameter pipe at a suction pressure of 9 inches. Under such conditions the NuTone polishing room is easily kept clean, a condition demanded for the proper finishing of chime tubes.

After polishing, chime tubes are transported to the air-conditioned spray and dipping room for final finishing. A Kirk & Blum air make-up unit supplies air to this room at the rate of 35,000 c.f.m. Air is drawn in from outside the plant, filtered, and maintained at a temperature of 72 deg. F. by thermostatic control. Of the volume of air supplied, 28,000 c.f.m. are removed through exhausts attached to two two-unit Binks water-wash spray booths and a dipping enclosure, and the Kirk & Blum overhead baking oven which adjoins the finishing room. The remaining 7,000 c.f.m. of air supplied leave the finishing department through two doors and two access openings for the overhead cable conveyor, so that the room itself is always under a slight pressure. Thus, what little dust exists in the factory proper is prevented from entering the finishing department to cause flaws in the painted or enameled products.

After polishing, chime tubes must be handled carefully and not touched with bare hands to avoid stains on the brass surface, which would be visible through the clear synthetic finish used as a protective and decorative coating for these products. In the finishing room polished tubes are dipped by

Fig. 3—These short seamless tubes have been subjected to a blanking operation for the removal of a considerable amount of metal. They are polished on centerless polishing machines with the aid of a steel mandrel which supports the thin brass shapes as they are fed through the machine. Photograph was made with one guard open to show belt mounting arrangement.

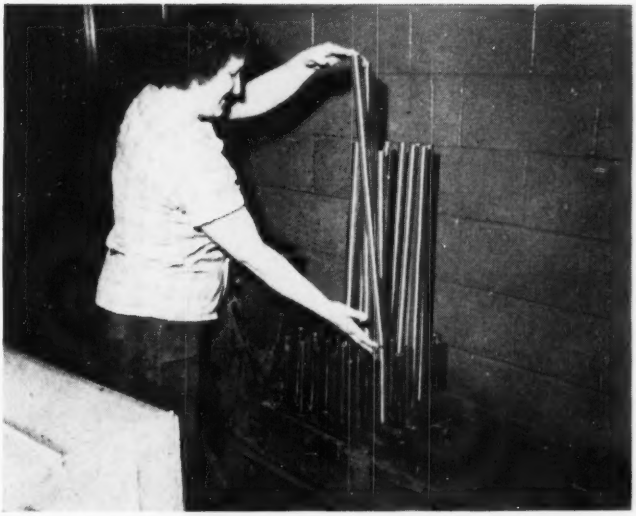


Fig. 4—Polished brass chime tubes are dipped two at a time in a clear synthetic finish and up-ended for draining over steel pegs in a draining rack. As a rack is filled with chime tubes, it is pushed to the right on the draining frame shown in the illustration, and an empty draining rack takes its place. Tubes are permitted to drain for the length of time needed to fill three draining racks (the capacity of the draining frame). Racks of drained chime tubes are then transferred to empty carriers on the cable conveyor.

hand, two at a time (see Fig. 4), into a clear synthetic baking finish (supplied by Cleveland Varnish Division, John Lucas & Co., Inc.), allowed to drain for a very brief period, and set on racks for complete draining and air drying for 3 to 4 minutes. As can be noted in Fig. 4, the drained material is collected by means of a sloping drain trough and, after proper regulation as to viscosity and solids content, it can be returned to the dipping tank. A metal-enclosed section of the finishing room is utilized for hand dipping long chime tubes. Sufficient air is exhausted from this enclosure to remove fumes and still ensure proper drainage of the coating material.

Racks of tubes which have drained are placed in universal carriers, designed to handle either racks of chime tubes or trays of other products manufactured by the company. The carriers, attached to and transported by a 200-foot long Buschman steel cable overhead conveyor, are routed past the door of the dipping room, so that transfer of the dipped and drained tubes to the conveyor (serving both dip tanks and spray booths) is quickly and efficiently accomplished. The conveyor passes near the spray booths before it enters the oven (see Fig. 5) where painted parts are baked for 20 minutes at 300 deg. F. There is a 5-minute preheating period, during which most of the volatile solvents leave the surface of the work, and a 5-minute cooling period during which the parts cool sufficiently to be handled, making a 30-minute baking cycle in all. (For emergency purposes, the system can be geared for a baking cycle of 15 minutes at 315 deg F.). The cycle for loading and unloading requires 30 minutes, so that it takes the cable conveyor one hour to make a complete cycle through the finishing system, traveling at the rate of approximately 5 feet per minute. The conveyor system is made more flexible by a variable speed drive by which conveyor speed can be set at any figure from 3 to 8 feet per minute.

Tubes and other NuTone products are baked in the overhead Kirk & Blum oven, which is 18 ft. wide x 30 ft. long x 7 ft. high, located at an elevation

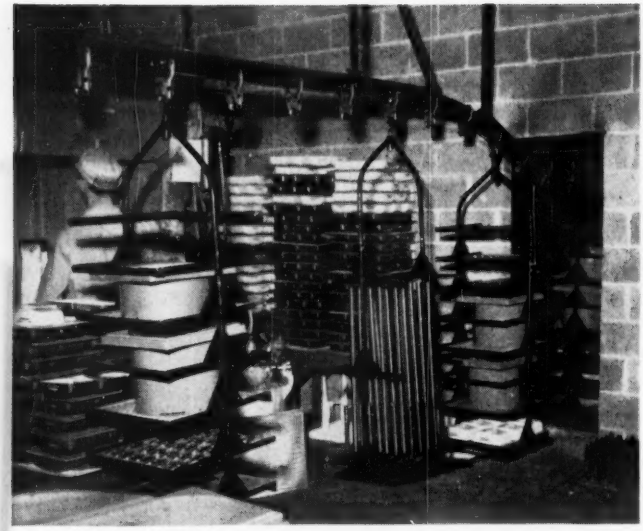
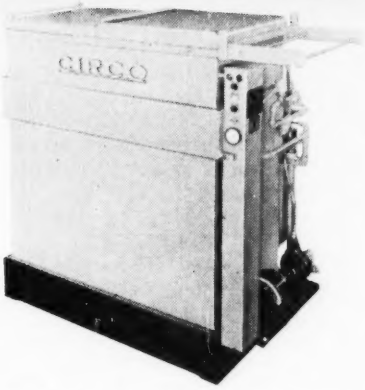


Fig. 5 — Illustration shows a rack of long chime tubes which has been placed on one of the cable conveyor carriers. As can be noted in the photograph, carriers are so designed that either racks of chime tubes or trays of sprayed parts may be suspended for baking. A portion of one of the spray booths located in the finishing room may be seen at the left of the photograph, and at the right center may be seen the entrance to the overhead oven through which all the painted products are processed.

of 6 feet above the plant floor. The oven is an indirect fired recirculating type, heated by a Surface Combustion gas burner. Seventy-five per cent of the air is recirculated through the heating system, and automatically controlled as to temperature by a Brown temperature recorder-controller (see Fig. 6). Both the intake and return recirculating ducts are located in the oven so that oven temperature is kept uniform throughout. A 750 c.f.m. exhaust fan is mounted above the oven, with its intake duct located along the furnace ceiling in the preheat area, where most of the solvent

Fig. 6 — Illustration shows a rack of long chime tubes emerging from the oven on the cable conveyor. Also shown in the photograph are the double doors comprising one entrance to the finishing room, and the automatic temperature controls for the oven mounted on the control panel in the right foreground. (*PRODUCTS FINISHING Staff Photos*)

Can You Afford Outmoded Metal Parts Cleaning?



A CIRCO engineered degreaser gives you

1. Thorough and speedy parts cleaning
2. Safe operation—uses a nonflammable, non-explosive solvent
3. Economy of operation
4. Long life with stainless clad, nickel clad or zinc sprayed construction.

Before and after nearly every production operation in the metal working industry, a cleaning operation must be performed. Are you risking high production costs with outmoded cleaning methods?

Circo vapor-spray degreasers eliminate costly, hand-labor operations. *Savings of over 90% in time alone are common.* Not only is valuable time saved but better cleaning is assured. Warm vapor, harmless to all metals, thoroughly penetrates every crack or seam. All traces of dirt, oil and grease are absolutely removed, leaving each part ready for immediate inspection. Depending on size, parts can be removed, *absolutely clean and dry,* in 1 to 15 minutes. Best of all, Circo's fully automatic control system guarantees operating economy.

CIRCO DEGREASERS PAY FOR THEMSELVES

For detailed information send for our catalog covering our standard degreasers. Our engineers will gladly work with you on metal cleaning problems requiring equipment of special design. A-3050

CIRCO

CIRCO PRODUCTS COMPANY

Metal Cleaning Equipment

6531 EUCLID AVE. • CLEVELAND, OHIO

PIONEERS IN THE DEVELOPMENT OF HOT VAPOR CLEANING EQUIPMENT

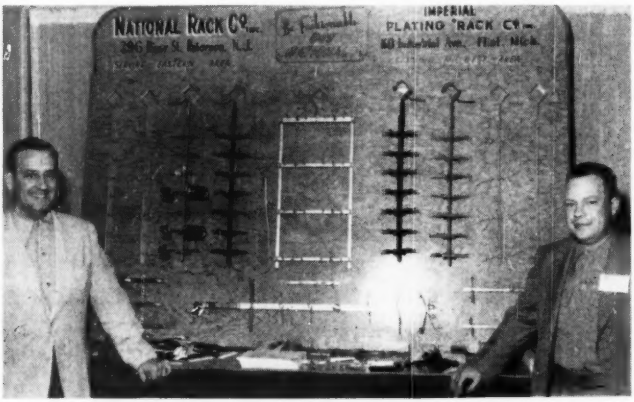
fumes originate. Thus, most of the fumes are removed before the work gets into the main part of the oven. Air locks at the oven entrance and exit counterbalance air pressure from the finishing room and minimize heat loss.

Circling through the oven for a thorough, even bake, the parts return to the floor level as they emerge from the oven, as shown in Fig. 6. Following a short cooling period, the finished parts are removed from the finishing room conveyor system and transferred to inspection and then to assembly where they are incorporated into the finished product.

Chime tubes are inspected 100 per cent for sound, and numbered according to tone. They are then grouped in sets of two, three, or four. Prior to assembly, tubes are plugged with an aluminum or steel plug, which, in operation of the door chime unit, is struck by the plunger. A felt strip is attached to the inside of each tube and covers half of the top of the tube circumference, so that each chime set may be adjusted for loud or soft chime sounds. Passing on down the assembly line, tubes are capped, and mounted on chassis. Other accessory parts, needed to make the assembly complete, are added.

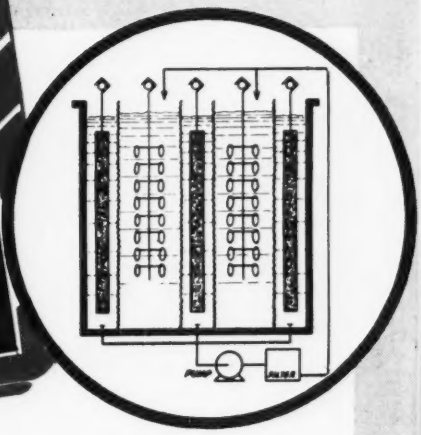
The company manufactures all the transformers and other accessory items used in chime production, so that it can ensure the qualtiy of the various parts and thus that of the complete product. Since these products are used under all kinds of climatic conditions, the finish, both from an appearance as well as from a protection standpoint, is a most important factor; it must be both durable and attractive to ensure consumer acceptance and continuous satisfactory operation of the products.

Chicago Vitreous Supply and Equipment Catalog. A porcelain enameling supply and equipment catalog in which has been included reference information is available from the Chicago Vitreous Enamel Product Co., Dept. PF, Cicero 50, Ill. Equipment listed, illustrated, and described includes steel and wood pickling tanks, pit dryers, Monel pickling baskets and racks, hoists, ball mills, mill linings, laboratory equipment, pumps, screens, magnetic separators, storage tanks, spray room equipment, brushes, and miscellaneous enamel processing supplies. Both the porcelain enameling supplies and the technical tables and charts are indexed for the convenience of the user.



William E. Neumeister (left), and William E. Zube flank the plating rack exhibit of National Rack Company, at the recent A. E. S. Convention.

ANSWERS:
To the 6 questions most frequently asked about
Diaphragming



1. WHAT IS DIAPHRAGMING?
A plating process that segregates the anolite from the catholite by means of a canvas screen between the anode and cathode compartments and provides for filtering the anolite.

2. WHAT ARE THE ADVANTAGES OF DIAPHRAGMING?
A smoother, more uniform grade of plating, higher current densities, less buffing, fewer rejections, lower plating costs. Filtering removes insoluables (organic and metallic) which deposit themselves on the work.

3. DOES DIAPHRAGMING ELIMINATE THE ANODE BAG?
Yes. Diaphragm tanks are equipped with insulated channels into which the screen slides. Anolite is pumped off floor of tank in anode section, through filters and discharged into cathode compartment.

Write for our Catalog Sheet No. 10

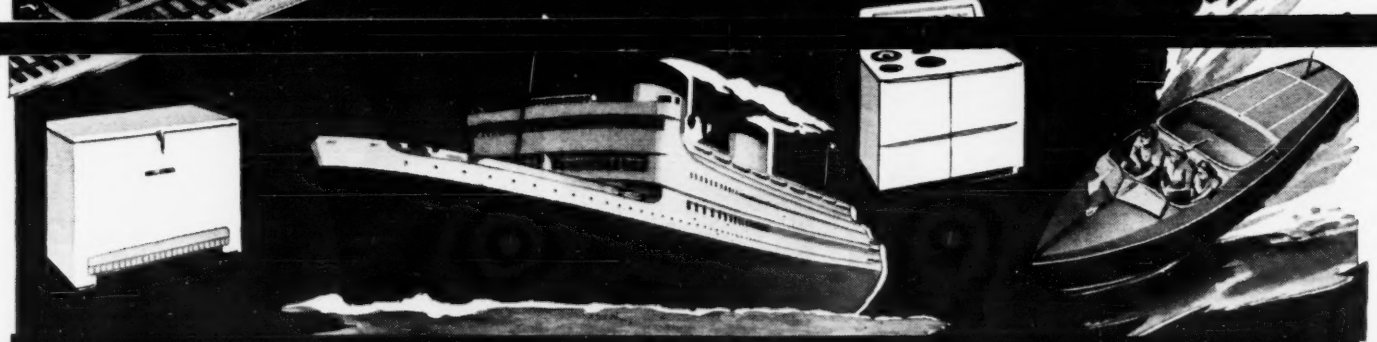
4. IS DIAPHRAGMING PROVEN?
Yes. While study goes forward, there are many installations in use and in process of construction. It is recognized as a "must" in progressive shops as future standard practice.

5. WILL I HAVE TO INSTALL NEW TANKS?
Many factors enter the picture. Perhaps your present equipment can be converted. It may be more economical to install new tanks.

6. HOW CAN I GET FIRST HAND ADVICE?
Automotive Rubber engineers have worked with Plating Engineers who developed the process — have made many contributions. They are thoroughly conversant with the subject and will work with you. Their recommendations are offered without obligation.

AUTOMOTIVE RUBBER COMPANY INC.
8601 EPWORTH BOULEVARD
DETROIT 4 • MICHIGAN

NOW... Pittsburgh offers
1. Weldseal Tape
2. Nu-Chromseal Tape
For better industrial sealing!

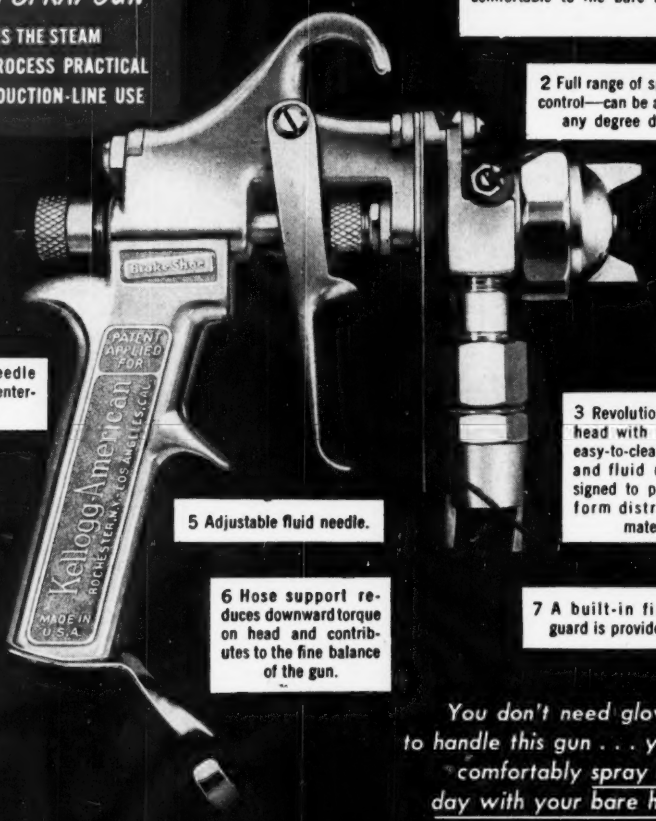


PITTSBURGH PLATE GLASS COMPANY

BRAKE SHOE ANNOUNCES A REVOLUTIONARY

that in one pass will apply a 2 MIL FILM *of*

THIS BRAKE SHOE
STEAM-SPRAY GUN
MAKES THE STEAM
SPRAY PROCESS PRACTICAL
FOR PRODUCTION-LINE USE



1 Exclusive insulation and radiating design assure trigger and handle temperatures which are comfortable to the bare hand.

2 Full range of spray width control—can be adjusted to any degree desired.

3 Revolutionary spray head with one-piece, easy-to-clean air cap and fluid nozzle designed to provide uniform distribution of material.

4 One-piece needle assembly—self-centering needle.

5 Adjustable fluid needle.

6 Hose support reduces downward torque on head and contributes to the fine balance of the gun.

7 A built-in finger guard is provided.

You don't need gloves to handle this gun . . . you can comfortably spray all day with your bare hand.

Write for descriptive brochure to:
KELLOGG DIVISION
93 Humboldt Street
Rochester 9, New York

AMERICAN
Brake Shoe
COMPANY

STEAM-SPRAY GUN....

HIGH VISCOSITY material

what Steam Spraying is

Steam spraying is a revolutionary spray painting method, developed by du Pont (patent applied for), using super-heated steam in place of air. Steam spraying efficiently applies high viscosity materials in a film thickness of 2 mils in one pass. It is a process that opens up new possibilities for industry in the reduction of finishing costs.

Steam Spraying is the practical answer to high-speed production painting

- Steam spraying may be applied to production operations at moderate installation costs.
- Steam spraying tremendously increases the productivity of existing equipment.
- Steam spraying makes possible the application of heavy one-coat films without sagging or popping.
- Steam spraying cuts finishing time.
- Steam spraying produces finishes equal in quality to conventional air-applied finishes.

Steam Spraying drastically cuts costs and increases production

- Steam spraying *reduces* the volume of material required by reducing overspray.
- Steam spraying *reduces* the amount of solvents and thinners required.
- Steam spraying *increases* the productivity of the operator by a broad margin.
- Steam spraying *reduces* labor costs.

another **BRAKE SHOE EQUIPMENT FIRST**
that is a step forward in painting equipment!

Fig. 1—At this table, facing the camera are A. P. Munning (with cigar), first vice president of the International Fellowship Club; George B. Hogaboom, A. E. S. Founder Member and first president, and Dr. William Blum. Standing (at left), Horace H. Smith, A. E. S. Founder Member, and I. William Marcovitch, Philadelphia Branch (sponsoring Branch for the 1953 Annual Convention).

A. E. S. BOSTON CONVENTION

A PHOTO STORY

(Photos shown on these two pages were taken at the Annual Open House, sponsored by the International Fellowship Club.)

Fig. 2—A. E. S. members in this group include Harold W. Faint, sales manager of Industrial Filter & Pump Mfg. Co.; Edward W. T. Faint, one of the Founders of A. E. S., and H. A. Gilbertson (extreme right), past president (1935) of the Society.

Fig. 3—(Left to right), J. A. Raskin, L. H. Butcher Co.; Michael Borushko, Harding Mfg. Co.; John J. Dale, Defense Research Laboratories, Maribyrnong, Melbourne, Australia; Granville M. Fillmore, PRODUCTS FINISHING; and Stanley J. Klima, Sperry Gyroscope Company.

Fig. 4—This group includes S. S. Johnston (at right), past president, A. E. S., and Clyde C. Kelly, one of the recent appointees to the A. E. S. Research Committee.

Fig. 5—(Center, facing camera) Dr. George P. Swift, co-chairman of the A. E. S. 1950 Convention, converses with William J. Neill, president of the A.E.S. for 1950-1951.

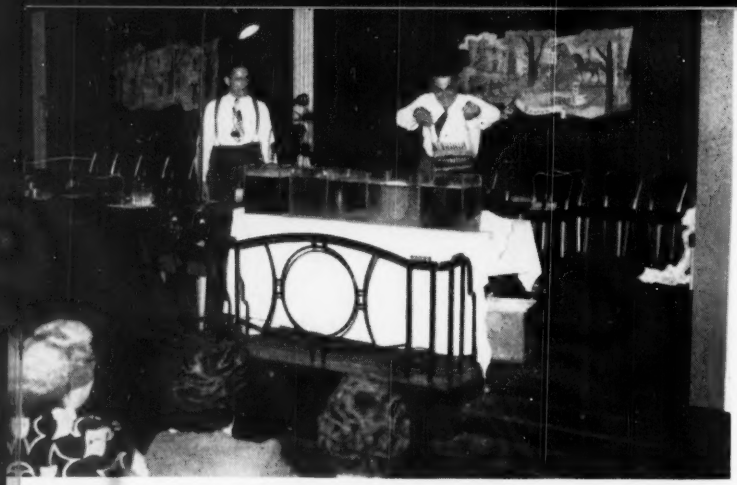


Fig. 6—Henry Strow, MacDermid, Inc., conducted a plating demonstration with the assistance of Louis V. Gagnon, president of the Boston Branch, before a special technical session arranged for the ladies.

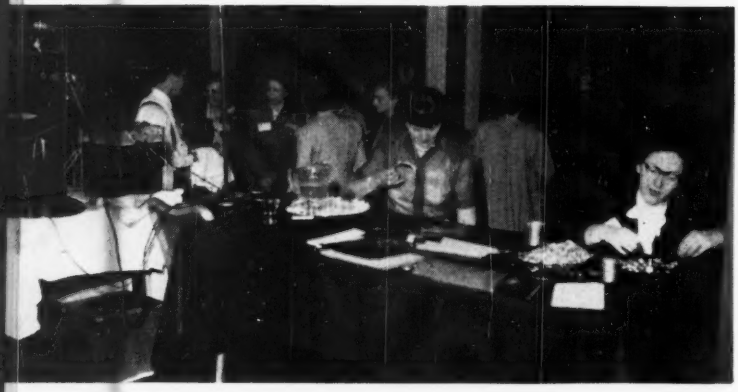


Fig. 7—After the plating demonstration, some of the ladies stayed to question Mr. Gagnon, and also to examine in detail some of the plated articles on display.

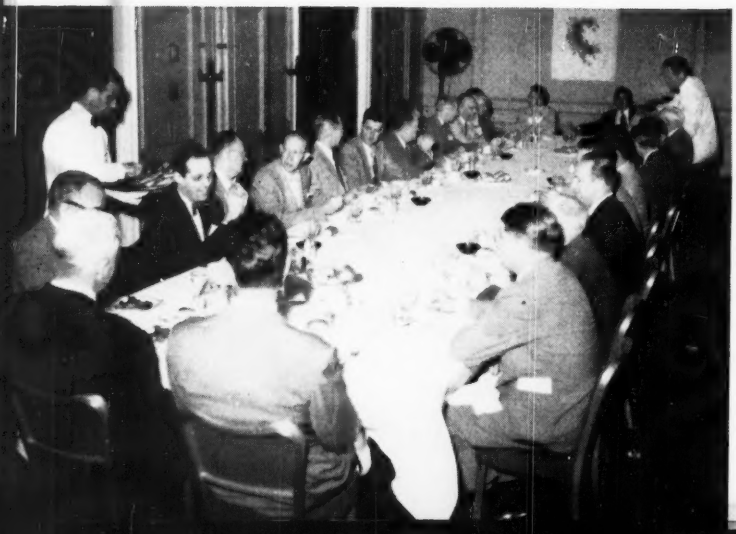


Fig. 8—A view of the job platers assembled for the Job Platers' Luncheon sponsored by the National Association of Metal Finishers.

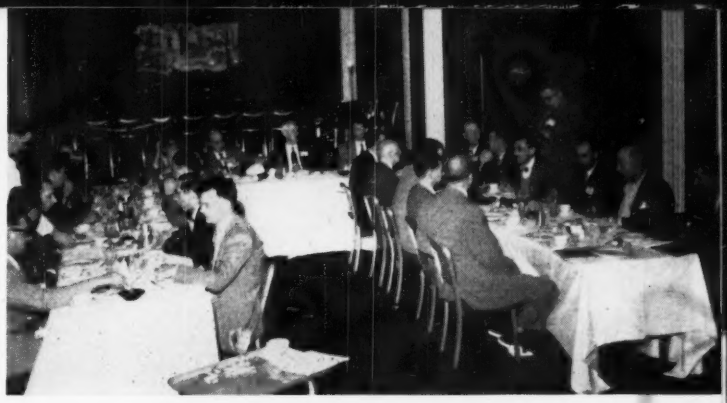


Fig. 9 — At the Electrodepositors' Technical Society Luncheon, platers from several countries were in attendance.

Fig. 10 — A partial view of the plated ware exhibit of the Chicago Branch, winner of first prize for Branch Exhibits.

Fig. 11—At the Clambake, lobsters and clams are removed from the steaming pits as platers from various parts of the country look on.

Fig. 12—(Left) Hubert M. Goldman, Enthone, Inc., answers a question following the presentation of his paper, "Metal Finishing by Abrasive Tumbling"; (center) E. E. Oathout, Behr-Manning Corporation, presents his paper, "Abrasive Belt Polishing"; (right) Van M. Darsey, Parker Rust Proof Company, talks on, "Flat Polished Phosphate Coated Steel Reduces Polishing Cost."

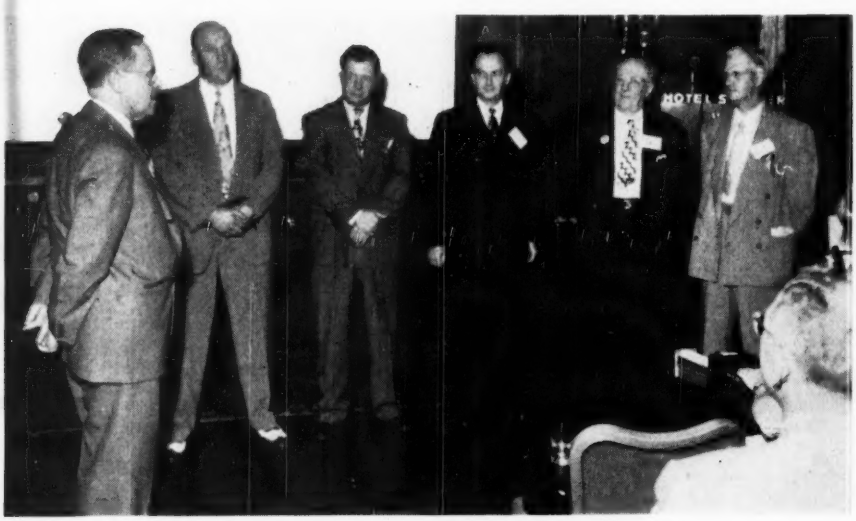


Fig. 13—Thomas F. Slattery (left), installs newly-elected officers of the American Electroplaters' Society: past president, Arthur W. Logozzo; president, William J. Neill; first vice president, Cleveland F. Nixon; second vice president, Franklyn J. MacStoker; third vice president, Dr. George P. Swift.

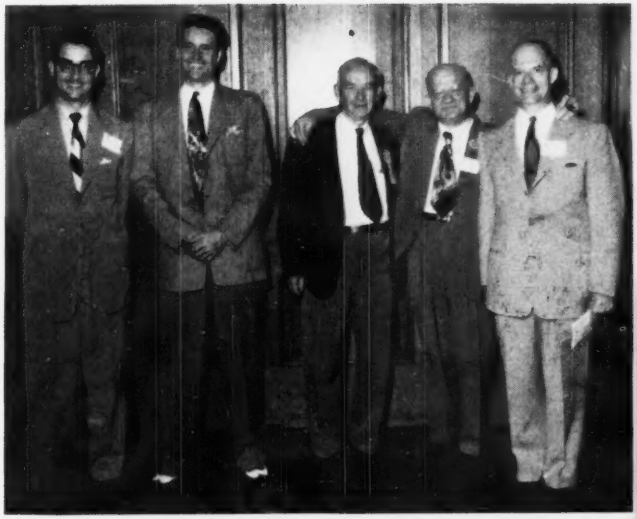


Fig. 14—(Left to right) Richard J. Wooley, Co-chairman of the 1951 Annual Convention to be held in Los Angeles; M. H. Orbaugh, Educational Chairman, 1951 Convention; Horace H. Smith, A. E. S. Founder and Honorary Member, Donald M. Bedwell, 1951 Convention Chairman; Clyde C. Kelly, staunch booster of the 1952 A. E. S. Convention to be held in Chicago.

Fig. 15—At the Annual Banquet, traditional closing event of the Convention, Myron B. Diggin, Hanson-Van Winkle-Munning Company, delivers a humorous address in presenting the Leather Order of the Grand Schlopp to Daniel Gray, Oneida, Limited.
(All photos by PRODUCTS FINISHING)

COMPLET

Mahon Finishing System specially engineered to meet the production requirements of Caterpillar Tractor Co., Peoria, Ill., manufacturers of Diesel Engines, Tractors, Motor Graders, and Earthmoving Equipment.

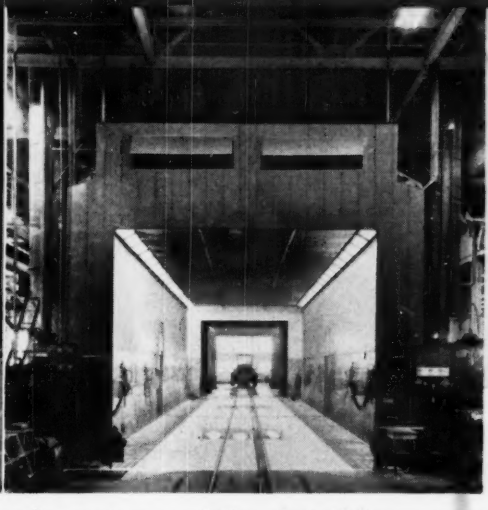
. . . the **EXPERIENCE** that goes into the **PLANNING** and **ENGINEERING** of **MAHON EQUIPMENT** is the item of **GREATEST VALUE to YOU!**

M

E

Finishing SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH



"Caterpillar" Diesel Tractors, Earthmoving and Road Building Equipment Painted in New Mahon Finishing System!

After purchasing several units of Mahon Finishing Equipment, which included Cleaning and Pickling Equipment, Spray Booths, and Drying and Baking Ovens, it was only natural that "Caterpillar" should turn to Mahon for a complete finishing system to handle painting of their Tractors, Motor Graders, and other units of heavy road building equipment on a straight line production basis. Mahon's solution to "Caterpillar's" requirements is illustrated above . . . it is a Complete Finishing System embodying a Cleaning Booth and a large Down-Draft, Tunnel-Type Spray Booth with an Integral Air Supply System which is controllable for volume and temperature. You, too, can reduce finishing costs with modern Mahon equipment planned and engineered to meet your specific requirements. If you are contemplating new finishing equipment, remember that the Mahon organization has pioneered development in this highly specialized field for over thirty years — and that Mahon engineers have, through constant research and experimentation, accumulated a wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon's Insert in Sweet's Mech. Ind. File, or write for Catalog A-650.

THE R. C. MAHON COMPANY

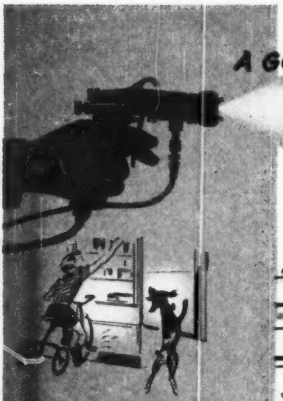
HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Pickling Equipment, Metal Cleaning and Rust Proofing Equipment, Dry-Off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Systems, and Drying and Baking Ovens; Core Ovens, Hydro-Foam Dust Collectors, Fog-Filters, and other Units of Special Equipment.

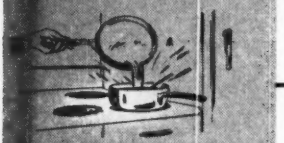
AHON

A GOOD START

...a Stronq Finish!



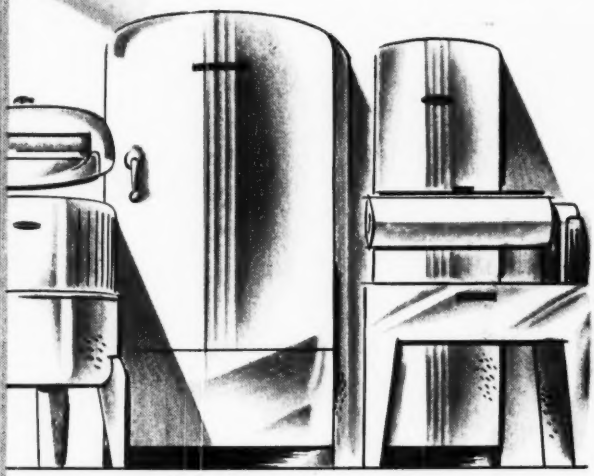
OUGH AND MARPROOF!
emclad formulations include special
gredients to protect finish against
rring, chipping or scratching.



OT GREASE? NO HARM DONE!
ven hot grease won't damage Kem-
lad's gleaming white finish!

TAYS WHITE AND STAIN-FREE!
emclad Finishes aren't affected by
od acids, weak alkalies, alcohols or
her common household chemicals.

CLEANS EASILY . . . SAFELY!
Kemclad's smooth surface cleans easily with damp cloth, but withstands strong detergents safely.



Appliance sales often *start* with the *finish.* They often end there, too, unless the finish has the punishment-resisting, white-for-life beauty made possible by the newest synthetic resin finishes!

Kemclad* Appliance Finishes are designed to adapt these qualities to the specific needs of appliance manufacturers. They provide the permanence and protection against abuse expected by today's buyers. Greater hardness and flexibility enable minor defects to be easily rubbed or "dinged" out after baking. Extremely high solid content with low viscosity give better protection at lower cost per finished unit. Write for details. The Sherwin-Williams Co., Industrial Division, Cleveland 1, Ohio. *Trademark

SHERWIN-WILLIAMS KEMCLAD* **APPLIANCE FINISHES**

ANOTHER PRODUCT OF SHERWIN-WILLIAMS INDUSTRIAL RESEARCH

How to make *LESS PAINT* do *MORE WORK!*

AS HANDY AS YOUR TELEPHONE

Kem Lustral Enamels are stocked, ready-to-use, at your local Sherwin-Williams branch store, in 31 standard colors, plus black and white. You'll find other Industrial Finishes stocked there, too:

- **LUSTRAL ENAMELS**
- **OPEX LACQUERS**
- **KEM ARTMETAL (WRINKLE) FINISHES**

You'll find a quick, handy, moneysaving answer to an amazing variety of production and maintenance problems in this all-round, top-quality Industrial Enamel!

Quick, because Kem Lustral Synthetic Enamels are as handy as your phone—stocked, ready-to-use, at your local Sherwin-Williams branch store.

Handy, because you can use them almost anywhere for anything— product finishing or maintenance—inside or outside—air-dried or baked—brushed, sprayed or dipped.

Moneysaving, because they provide the same high-quality pigments and vehicles of the best special finishes obtainable, but at less cost because of large-volume production and nation-wide distribution!

Call your Sherwin-Williams branch store—get acquainted with them and with this flexible, quality coating! The Sherwin-Williams Co., Industrial Division, Cleveland 1, Ohio.

Another product of Sherwin-Williams Industrial Research

SHERWIN-WILLIAMS INDUSTRIAL FINISHES

Spotlighting FINISHING Progress

Factors Affecting the Adhesion of Organic Coatings

THE useful life of any organic finish depends on two major factors—the durability of the organic coating film itself, and the adherence of the film to the surface to which it is applied. As a rule, evidence of poor adhesion, such as flaking, peeling, and easy removal by some external force, are so obvious to the finishing technologist that they suggest a simple cause for the loss of adherence. Actually, however, this final evidence of loss of adherence is usually the result of a number of factors, some of which have acted to set up various competing forces.

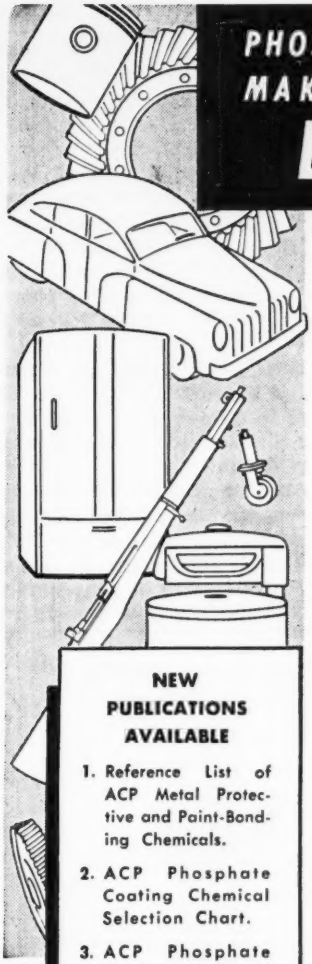
In discussing the adhesion of organic coatings before a recent Symposium on Varnish and Paint Chemistry sponsored by New York University, College of Engineering, Professor Charles J. Marsel brought out the fact that past experience has indicated a plausible breakdown of adhesion into two basic phenomena: (1) mechanical adhesion; (2) specific adhesion. The former is of a physical nature; thus, if the fluid coating can penetrate into the minute interstices in the metal, or if it can penetrate into a surface film of oxide, prosphate or other compound which itself is adherent to the metal, the result on drying is an interlocking of coating and surface. The term "specific adhesion," on the other hand, is used to describe the molecular forces acting at the interface

By DR. ALLEN G. GRAY

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

PHOSPHATE FINISHES TO MAKE YOUR PRODUCT DURABLE

CHEMICALS ACP PROCESSES



PAINT BONDING

"Granodine" forms a zinc-iron phosphate-coating bond on sheet metal products — automobile bodies and fenders, refrigerator cabinets, etc. — for a durable, lustrous finish.
"Lithoform" makes paint stick to galvanized iron and other zinc and cadmium surfaces.
"Alodine", the new ACP protective coating chemical for aluminum, anchors the paint finish and protects the metal.

RUST PROOFING

"Permadine", a zinc phosphate coating chemical, forms on steel an oil-adsorptive coating which bonds rust-inhibiting oils such as "Granoleum."
"Thermoil-Granodine", a manganese-iron phosphate coating chemical, forms on steel a dense crystalline coating which, when oiled or painted, inhibits corrosion.

PROTECTION FOR FRICTION SURFACES

The oiled ***"Thermoil-Granodine"*** coating on pistons, piston rings, cranks, camshafts and other rubbing parts, allows safe break-in operation, eliminates metal-to-metal contact, maintains lubrication and reduces the danger of scuffing, scoring, galling, welding and tearing.

IMPROVED DRAWING AND EXTRUSION

"Granodraw" forms on pickled surfaces a tightly-bound adherent, zinc-iron phosphate coating which facilitates the cold mechanical deformation of steel, improves drawing, and lengthens die life.

Write or call for more information on these products, and advice on your own metal-working problem.

NEW PUBLICATIONS AVAILABLE

1. Reference List of ACP Metal Protective and Paint-Bonding Chemicals.
2. ACP Phosphate Coating Chemical Selection Chart.
3. ACP Phosphate Coating Chemical Descriptive Folder.

Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY

AMBLER, PA.

Manufacturers of Metallurgical, Agricultural and Pharmaceutical Chemicals

between the given surface and the applied finish. This type of adhesion depends upon the existing adsorptive forces at the interface as well as the chemical affinity of certain coating components toward the metal itself. Several variations of this theory have been presented. Of most interest are the concept of Moses postulating the dependence of adhesion upon a quasi-fluid or mobile state at the film-metal interface, and Nettmann's theory of varying potential energy in the average paint film, which he pictures as consisting of three layers.

The term adhesion when applied to organic finishes refers to the bond developed between the paint film and the base metal. While there is no simple explanation to account for the ultimate strength of the bond, it has been conclusively demonstrated that measured adhesion values are a function of several factors. Four principal factors affecting adhesion were listed by G. H. Young, Mellon Institute, in the recent "Corrosion Handbook." They are: (1) the degree of cleanliness of the metal surface and thus its ability to be "wetted" by the resin; (2) the chemical nature of the polar groups along the macro chain, that is, whether it contains such groups as COOH, OH, $CONH_2$; (3) the average chain length up to a polymerization degree of about 4000 to 5000; and (4) the content of non-resinous polar compounds, which is an inverse function in this case.

According to Prof. Marsel, the work at New York University, which was a part of a general project sponsored by the Squier Signal Laboratory, Signal Corps, Fort Monmouth, N. J., had as its purpose limiting the number of procedures necessary to give an overall satisfactory paint film. More specifically, it dealt with fundamental studies made on certain aspects of adhesion in the belief that this would be one of the

10 TIMES HIGHER ABRASION RESISTANCE
(standard abrasive wheel test)

SURETY
SURESEAL
SYNTHETIC RUBBER
industrial gloves

PLUS

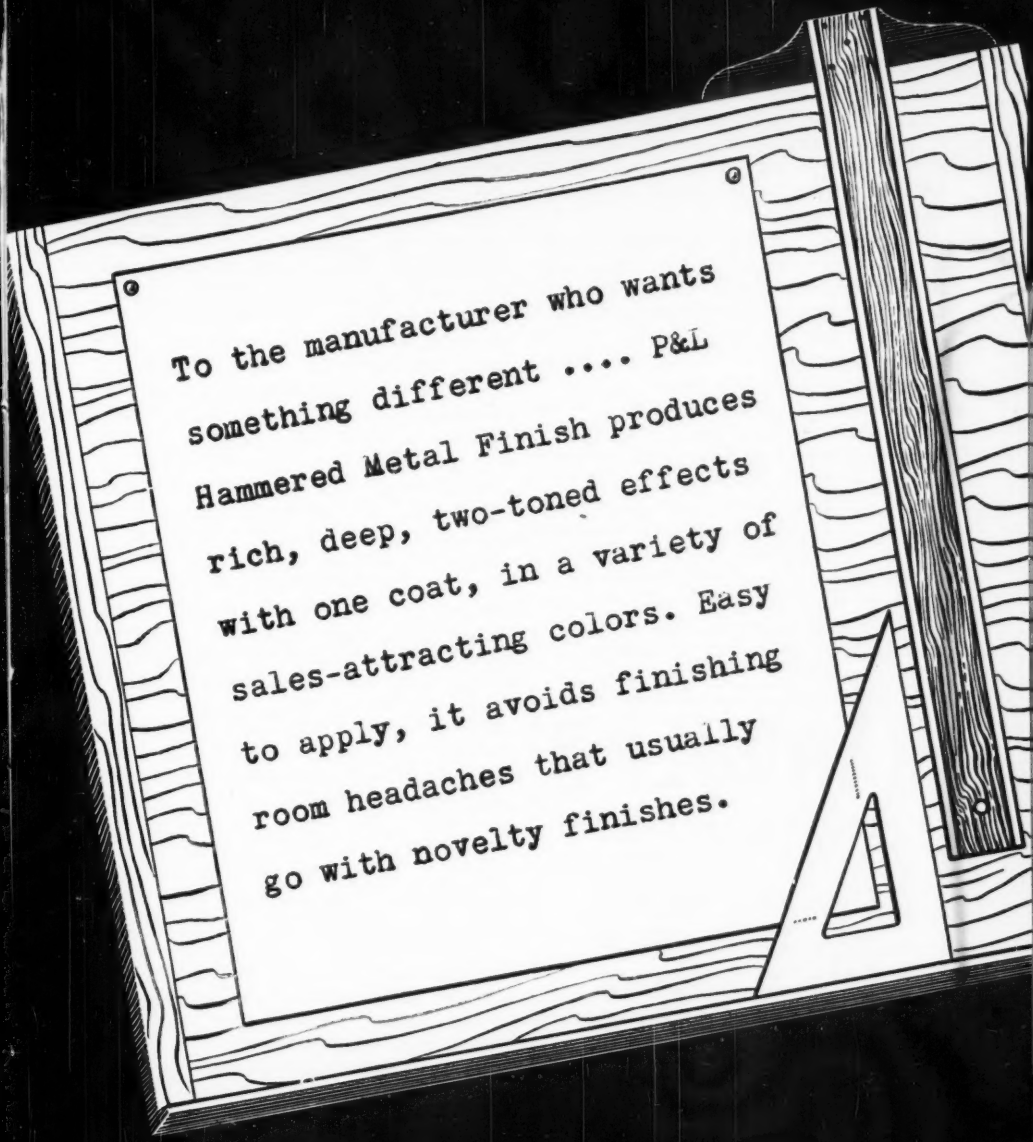
Sureseal Synthetic's higher snag and chemical resistance means safer, longer-wearing gloves—*much* lower glove costs.

Standard tests show that Sureseal Gloves are miles ahead on all counts—besides higher abrasion resistance, Sureseal Synthetic Rubber has 4 times higher snag resistance, much higher chemical resistance, than either natural rubber or standard synthetics.

Get more hand protection for less money in your plant—ask your distributor about Surety Sureseal Gloves, or write direct.

THE SURETY RUBBER CO.
DEPT. P
CARROLLTON, OHIO

In Canada: SAFETY SUPPLY COMPANY, Toronto, Ontario


To the manufacturer who wants
something different .... P&L
Hammered Metal Finish produces
rich, deep, two-toned effects
with one coat, in a variety of
sales-attracting colors. Easy
to apply, it avoids finishing
room headaches that usually
go with novelty finishes.

PRATT & LAMBERT-INC.
Industrial Finishes
NEW YORK BUFFALO CHICAGO
FORT ERIE, ONT.

REGISTERED P&L TRADE MARK

keys to a solution of the general problem. The studies have shown that the physical and chemical states of both the base metal and organic coating, wet and dry, constitute the controlling factors, in the development of an adhesional bond.

There is a marked improvement in mechanical adhesion if the metal surface is roughened prior to film application. The improvement in mechanical adhesion due to the increase in the number and size of the surface interstices is obvious, but there is also an increase in specific adhesion due to the greater contact area. Certain anti-corrosion pretreatments that produce coarse firmly adherent salts on the metal surface, for example, phosphate, chromate, or oxalate, or the presence of certain oxide films, such as cuprous oxide, give a beneficial effect. However, if such films themselves have poor adherence to the base metal, it makes for poor overall adherence.

RANDOLPH
LACQUERS, ENAMELS
DOPES, THINNERS
Clear Metal Finishes
Clear S.G. For Metal
Colored Lacquers
Texture Enamels
Aircraft Finishes
Specialized Production Finishes
PRODUCTS
RANDOLPH PRODUCTS Co.
CARLSTADT, NEW JERSEY

More important than the contour of the metal surface, however, is its chemical nature. According to Prof. Marsel, the molecular forces on which the specific adhesion depends can act only through short distances of the order of a few hundred Angstrom units (one Angstrom unit equals 3.937×10^{-9} inches). The presence of a contaminating layer of rust, oil, or grease, even if only a few molecules in thickness, may be sufficient to affect adversely the adhesional bond. Thorough mechanical and chemical methods of cleaning must be employed to ensure an uncontaminated surface in all organic finishing procedures.

Much research in the organic coating itself has revealed how its properties can be varied and controlled in order to improve adhesion. The careful use of thinners and wetting agents as well as choice of the proper mode of application can contribute toward good adhesion. The incorporation of "active agents" to promote adsorption and therefore a stronger bond offers additional possibilities for improvement. One interesting example of this technique is that of a commercial vinylite resin which contains a small amount of free maleic anhydride copolymerized. The free carboxyl groups provide enhanced adhesion to this product as compared to a regular vinylite when used in protective coating compositions.

The strength and tensile properties of the dried coating cannot be neglected in any consideration of factors affecting adhesion. If a film is strong but not sufficiently elastic, an adhesional failure may result from shrinkage or swelling stresses which may develop on curing or aging. Also, a brittle film may fail in cohesion close enough to the metal surface so as to have an adverse effect on the adhesion. Another point of vital importance is the permeability of the coating. If an organic film is highly permeable to moisture, interfacial reactions occur

Announcing

STEVENS' CONSOLIDATION WITH THE UDYLITE CORPORATION

to bring our customers more complete plating service

The merger of Frederic B. Stevens, Incorporated, with the Udylite Corporation marks a significant development in the plating industry.

Under our new organizational set-up, all of the Stevens products and services which—for over sixty-five years—have helped our customers cut costs and raise production will be retained—and augmented by Udylite's famed technical and engineering facilities.

Stevens can now serve you by providing—in addition to time-tested production equipment—regular continuous servicing of Stevens' equipment by the foremost field technical team—electrical service which provides the correct current supply and controls equipment—chemical engineering service for the processes best suited to your problem and supplies that have been tested in the Industry's finest laboratory. Now Stevens can deliver to you a complete package ready for a turn of a switch—with assured plating results and satisfactory service year after year.

This close integration of Stevens and Udylite products and services will give the words "Plating Service" a new —and deeper meaning to the metal finishing field. Let us show you what we can do for you. Call us today. There's no obligation.

SINCE 1892

LEADING MANUFACTURERS OF POLISHING, BUFFING, PLATING EQUIPMENT AND SUPPLIES

FREDERIC B. Stevens INCORPORATED
DETROIT 16, MICHIGAN

METAL FINISHING EQUIPMENT AND SUPPLIES DIVISION

FREDERIC B. STEVENS OF CANADA, LTD. WINDSOR, TORONTO, ONTARIO

A Parco Cleaner costs you more per pound than your present metal cleaner. Yet cleaning economy—actual money savings—is reported from plant after plant, after changing to a Parco *Formulated* Cleaner.

Parco Cleaners are specially formulated to clean and condition metal surfaces for the next step in the finishing operation, to reduce cleaning time, operating temperatures and concentration of cleaner used. Surface area cleaned per pound of cleaner material is the basis of cost comparison of metal cleaning.

Try a Parco *Formulated* Cleaner. See if it doesn't save money for you, too.

- **Emulsion and Solvent Type**—Spray and immersion cleaners for removing oil, grease and soil from metal surfaces.
- **Acid Type**—Four cleaners for quick, effective removal of rust and scale from iron and steel.
- **Alkaline Type**—Light and heavy duty spray and immersion cleaners. For removal of oil, grease and soil from metal surfaces.

Bonderite, Parco, Parco Lubrite—Reg. U. S. Pat. Off.

Parker RUST PROOF COMPANY
21/2 E. Milwaukee Ave.,
Detroit 11, Michigan

BONDERITE—Corrosion Resistant Paint Base • PARCO COMPOUND—Rust Resistant
PARCO LUBRITE—Wear Resistant for Friction Surfaces

and the products of these reactions destroy the adhesional bond.

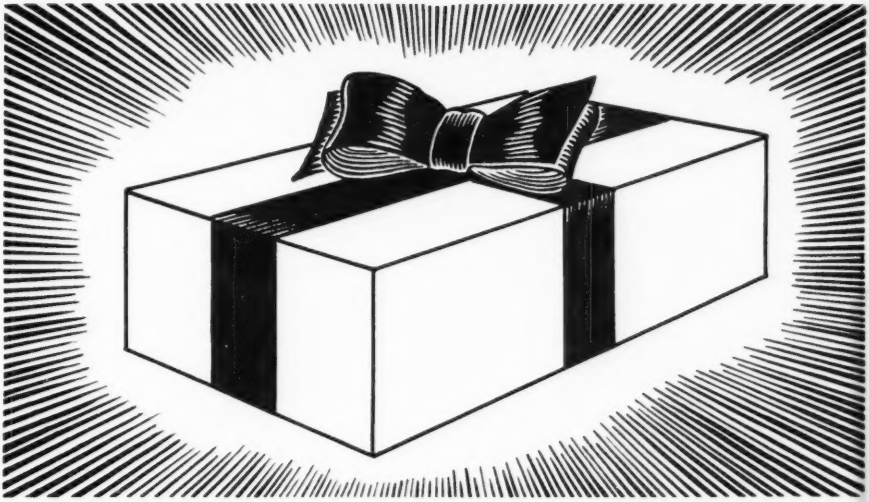
Surface Preparation for Good Adhesion

Premature adhesion failures may be blamed on the finishing materials, when the true cause is improper surface preparation, or detrimental contamination on the surface prior to painting. The cleaning and preparation of metal for painting is so well understood that it is apt to receive but minor consideration. The fact that it has a definite function in relation to the useful life of the paint finish is often overlooked. Providing metals with a nonmetallic coating of the proper texture adapted to inhibit corrosion and increase the adhesion of the final organic finish is a widely-used method of preparation for painting which has been adapted to modern production line operations.

A variety of industrial methods are utilized for cleaning and preparing metals for painting. Strictly speaking, the term "cleaning" as applied to preparation of metals for painting, should be limited to the removal of dirt, oil, and grease without chemical or mechanical change in the surface characteristics.

Various type of alkali, emulsion, and organic solvent (trichlorethylene) cleaning constitute the simplest methods used in preparing metal for organic coatings. These methods provide only for the removal of foreign matter, grease, and oil, without imparting any material change in the surface of the metal. The greatest possible success obtainable from such methods is an absolutely clean metal surface. The most effective solvent cleaning process is the chlorinated solvent vapor degreasing process.

A variety of alkaline solutions for immersion cleaning of steel are available. The immersion time for satisfactory cleaning will vary with the degree of contamination of the prod-



We make packages that are *never* opened

. . . because our packages are the coatings wrapped around thousands of industrial and consumer products: to add to their appearance, increase their usefulness, and lengthen their life . . . in short, to boost their sales appeal.

Stanley coatings and finishes can move your products faster, because our chemists work with your engineers to create just the right finish for your specific product application.

Our emphasis at **Stanley** on "special finishes for special applications" has helped to sell products throughout industry: your product need be no exception. Write us about your finishing needs today: **Stanley Chemical Company, East Berlin, Connecticut.**

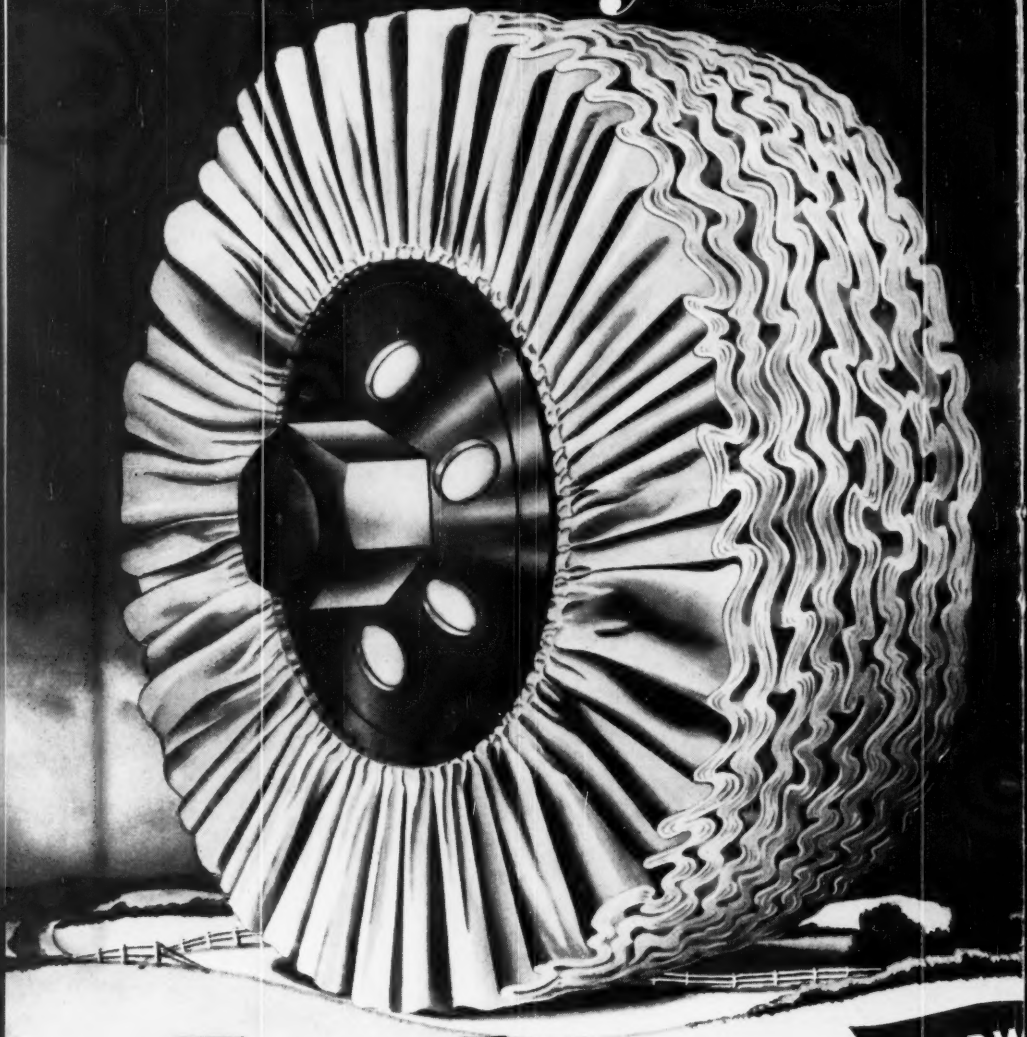
STANLEY

Industrial Coatings

STANLEY CHEMICAL

LACQUERS · SYNTHETICS · JAPANS · ENAMELS

What's your



Jackson

AIRW
Ventil

21-03 FORTY-FIRST AVENUE

buff mileage?

...and your oil consumption ...
...it plugs.

...your buffs with the same discrimination ...
...buffs be the flat tire in your polishing ...

JACKSON *AIRWAY VENTILATED* ...
type will . . .

1. Out-produce any other ...
2. Out-perform any other ...
3. Reduce your net buffing ...

We will supply the samples. Our ...
... in any and all of your tests. ...
... the types of JACKSON AI...
... your job with the eff...

...AY
...ated

Buffs

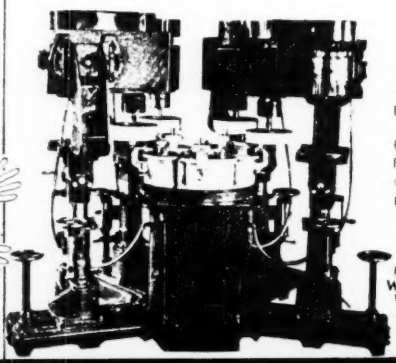
LONG ISLAND CITY 1, N. Y.

WARNING NOTICE—Jackson Buff Corp. of Long Island City, N. Y., has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.

FOR *Automatic* POLISHING AND BUFFING

ARREST THAT MAN

It doesn't take a Sherlock Holmes to ferret out the reason for high costs if hand labor had a part in the job. Here at Packer-Matic we came to that conclusion long ago and set about designing machines that speed up porduction and lower costs by ***automatically*** polishing and buffing.



There's a Packer-Matic for all shapes, metals and finishes. Write for factory time study - send part and finish desired.

No. 4-S Indexing Type With Oscillating Wheel Heads

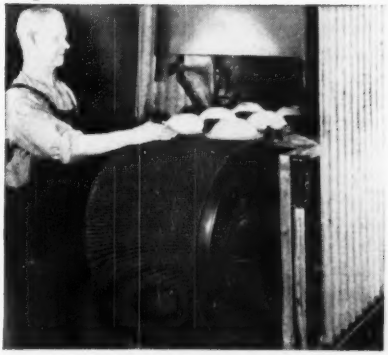
Packer-Matic

THE PACKER MACHINE CO., MERIDEN, CONN., U. S. A.

NO WASTED MOTION HERE

with

Cambridge WIRE BELTS



A Cambridge Rod-Reinforced Belt permits continuous, uniform heat treating of metal parts. Open mesh assures free circulation of heat and air—design gives greatest strength, straight travel and successful operation up to 2100° F.

Cambridge Wire Belts are efficient workers in your field. They serve in heat, cold, corrosive and wet processes; through packaging and assembly operations—moving quickly or slowly at constant or varying speeds. Wherever a material can be processed during movement, a Cambridge belt can, and does, save time, money and floor space.

Cambridge offers you a modern engineering staff with experience in your field and skilled workmen to produce the right belt in the correct mesh and weave, metal or alloy to perform your operation better . . . for longer.

Consult your Cambridge representative — look under "Belting, Mechanical" in your Classified Telephone Directory or write direct.

FREE BOOK—Famous throughout industry as the most valuable reference work on belts and conveyor systems. Write for your free copy . . .

Cambridge Wire Cloth Co.

Wire cloth in rolls. Also specialized wire fabrications

Department A
Cambridge 7, Mass.

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

uct. Alkaline spray cleaning is often done in mechanical washing machines which employ a conveyor or belt to transport the parts through the cleaning, rinsing and preferably the drying stages. The selection of a cleaner should be based on cleaning ability and economy. Another important consideration is the ease of rinsing the cleaner composition from the surface, since no trace of chemical should be left on the surface if optimum adhesion of the coating is to be secured.

Any cleaning procedure in which the final water rinse contains small amounts of alkali or soluble salts will leave invisible and active residue on the surface of articles rinsed therein, which is apt to cause premature failure of the paint. One method that has been suggested to protect against the presence of alkali in the rinse water is to maintain the solution at a pH below 5 with a mixture of chromic and phosphoric acids. It is known that the degree of blistering in a paint finish adversely affects the protective life of the coating, wherever moisture is a factor.

A test frequently specified to determine when a metal surface is clean is to immerse it in water and observe upon removal if it will support a film of water, breakfree. However, this test does not reveal the presence or absence of acids, alkali, or salts on such surfaces and cannot be relied upon entirely as a test for determining the suitability of a surface for organic finishing. One method that has been used to test a given procedure for metal preparation for cleanliness and suitability for painting is to immerse the painted article in water for 24 to 48 hours. This is usually sufficient to reveal blistering in the paint coating at areas which contain active residue. The effect of oil underneath the paint coating can usually be detected by an adhesion test, such as is described

A Strippable Plastic for the Protection of Metals

Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.

THE STRIPLASTIC COMPANY

Among many advantages, it is non-toxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

10828 QUEBEC AVE.
CLEVELAND 6, OHIO

DON'T LET MATERIAL HANDLING COSTS THROW YOU FOR A "LOOP"

Save

TIME
SPACE
MONEY
MANPOWER
with

LOOP AROUND
STRAIGHT LINE
DUAL STRAND
BELT • SPECIAL

JENSEN CONVEYORS

In the mechanical processing of any product, control of work flow is a vital cost factor. The "right" type of conveyor, correctly designed, constructed and strategically located can be a dividend-paying investment.

Such an installation is the Jensen Overhead Conveyor shown above, which permits the continuous conveying, dipping, draining and baking of painted tricycle parts in a Jensen Overhead Electric Radiant Heat Oven.

Whether your conveying requirements call for wire mesh, loop around, straight-line, stainless steel, canvas or rubberized belting makes no difference—*Jensen makes them all*, skillfully designing and engineering the installation to keep material handling costs at "rock bottom."

Many years of experience in designing and installing all types of mechanical handling systems gives authority to the advice and recommendations of Jensen engineers on *coordinated* conveying. *How can we help you?*

Jensen SPECIALTIES INCORPORATED

• Representatives in Principal Cities

9331 FREELAND AVENUE • DETROIT 28, MICHIGAN

MANUFACTURERS OF *ECONOMY-ENGINEERED* RADIANT HEAT EQUIPMENT

"DUAL HEAT" INFRARED OVENS • CONVEYORS • PAINT DIP TANKS

subsequently in a discussion of the methods for evaluation of adhesion of organic coatings.

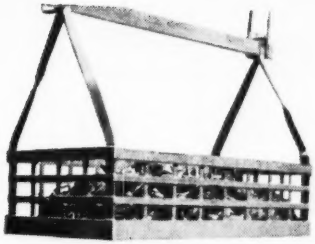
Methods of surface preparation for organic coating which alter surface characteristics mechanically or chemically include mechanical means of preparation such as sand and shot blasting, which roughen metal surfaces so that organic coatings will more readily adhere. Chemical methods of preparation include acid pickles, as well as others involving the use of phosphoric acid and a grease solvent to clean and etch the metal surface to provide better adhesion for applied paint finishes. These methods impart a roughness to the metal surface which increases the initial adhesion of applied organic finishes, but does not provide any appreciable protection for inhibiting corrosion of the metal. It is generally considered that because of the increased activity of metal prepared by these surface roughening methods, the metal tends to corrode rapidly. Metal so prepared should be painted as soon as possible following the treatment.

HOLLAND SAYS:
DEBURRING WILL CUT GRINDING COSTS
Motor Driven Tilting Tumbling Barrels for cleaning, polishing, grinding, deburring, sanding, burnishing and various other applications.
Wide selection of metal finishing equipment on hand. Write for FREE folder "M."
J. HOLLAND & SONS, INC.
MANUFACTURERS • DEALERS
276 SOUTH NINTH ST. • BROOKLYN, N. Y.

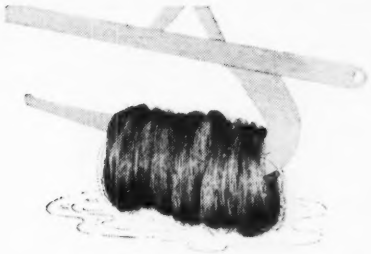
Metal products are generally freed of oil and grease before they are sand blasted or shot blasted. This precaution prevents the abrasive material from becoming contaminated and the grease from being driven into the metal. In shot blasting, it is particularly necessary to avoid contamination of the shots, to provide a grease-free surface which will provide good paint adhesion. Ordinarily acid pickling removes scale from metal and etches the surface. The operation should be followed by thorough water rinsing to insure the removal of any adhering salts from the metal. The primary factor in the pickling operation is to remove scale and to etch the metal surface and provide better adhesion for the final paint finish.

Methods of surface preparation which convert metallic surfaces to a non-metallic coating that inhibits corrosion and increases the adhesion and resultant durability of applied organic finishes require the removal of all grease and foreign matter prior to the formation of the protective conversion coating. Instead of activating the metal, such as results from acid etching and mechanical blasting, the surface is converted into a more stable and less reactive medium as a base for organic coatings. Thus, because of the increased resistance to corrosion, metal products prepared by the use of conversion coatings do not have to be coated immediately in order to secure satisfactory adhesion.

Phosphate coatings are widely used in preparing metals for organic finishing. The method of applying the phosphate coating is usually determined by the size and shape of the article to be coated. Small articles such as nuts, bolts, screws and stampings are coated by immersing in the phosphating solution, whereas large parts such as au-

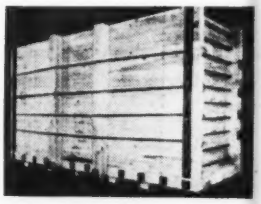


Monel basket, replaced a wooden unit of same exterior size; approximately doubled the capacity.



Monel hook, still in use after 3½ years, has already given 6 times the best life of other metals.

For Baskets... for Hooks
For Tie-rods... for Crates
The Metal is Monel



Monel tie-rods actually help wooden tanks last longer.

If you have a steel pickling operation in your plant, you have a job for Monel®.

No other metal offers so many advantages for steel pickling service; meets all your needs so well.

First, of course, you need resistance to corrosive pickling acids. *You get it with Monel.* Many long-service records are your proof.

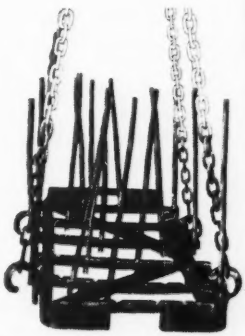
Then, you need a metal that is strong, tough and ductile. Strong, so that thinner sections can be used to minimize deadweight. Tough, so that shocks can be safely absorbed. Ductile, so that there is less chance for sudden, dangerous failures. Again, *you get all these properties with Monel.*

Monel gives you maximum versatility in design, too. Working with the large variety of wrought mill forms available, fabricators can produce the exact equipment you need. Equipment specifically designed to do *your* job best.

Remember Monel next time you order pickling equipment. Monel is adaptable to all pickling requirements. It is used for baskets, crates, racks. For hairpin hooks, tie-rods, nuts and washers. For all types of chain and accessories.

SEND FOR NEW BOOKLET!

For your copy, or for more information on Monel and Monel fabricators, write to our Ray Reddell.



19-year-old Monel crate... and still on the job.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Monel
PICKLING EQUIPMENT

extra life
extra capacity
extra safety

TABLE I

Retention of Paint by Untreated and Phosphate-Coated Steel

SURFACE TESTED	Primer Wt./Sq. Ft. Retained Oz.	Increase in Retention Over Untreated Steel Per Cent
Steel, untreated	0.139	——
Steel, phosphate-coated (roller)	0.177	27.3
Steel, phosphate-coated (spray)	0.200	43.9
Steel, phosphate-coated (dipping)	0.242	74.0

tomobile bodies and refrigerator cabinets are sprayed. The solutions react chemically with the metal until the surface is converted into a crystalline phosphate coating. In addition to increasing the adhesion of the paint films to metal surfaces, the phosphate coating retards underfilm corrosion and the spread of corrosion wherever the paint film is scratched or abraded.

The retention of organic finishes by metal surfaces is an important factor, especially where its application is by dipping or flow coating and the part contains sharp edges. During curing or drying, most paint films tend to pull away from edges because of poor adhesion, thereby resulting in reduced film thickness at such areas. Table I shows the amount of paint remaining on untreated and phosphate coated steel applied in various manners, based on data reported by V. M. Darsey, Parker Rust Proof Company, in the recent "Corrosion Handbook." (Sponsored by Electrochemical Society and published by John Wiley & Sons.)

The increased adhesion retention of paint to phosphatized steel in relation to untreated steel is a primary factor in preventing the spread of corrosion from edges of painted surfaces.

Because of the reactive nature of zinc, it is ordinarily difficult to obtain good paint adhesion without adequate chemical treatment of the surface. Phosphate coating of zinc and zinc alloys increases the adhesion and resultant durability of applied organic finishes. Several processes are available by which protective surface films consisting essentially of chromium salts can be produced on zinc surfaces prior to organic finishing. Chromate coatings are also used on magnesium alloys to improve the adhesion of organic coatings; good paint adhesion is assured by absorption of the coating of various types, and chemical or electrochemical oxide coatings are used to increase the adherence of organic finishes to aluminum surfaces. Figure 1 shows a series of tanks for chemically treating aluminum parts at the plant of Reynolds Metals Company. Oxide coatings on copper and brass are reported to increase the adhesion of organic finishes.

Chemical Nature of the Finish Affects Adhesion

Questions as to what makes an organic finish adhere to a metal surface, and how adherence may be improved arise frequently in industrial finish manufacture. Every organic coating material, whether oil, paint, varnish or lacquer, consists of a complex mixture of diverse kinds, sizes, and shapes of molecules. This heterogeneity is essential for proper film forming characteristics. In the resin phase, a coating material consists of very large molecules which may be long chains, closed chains, cross-linked chains, or any combination of these types. These

MULTI-PURPOSE

NEW TYPE COATING

1. Prolongs product life

2. Cuts structural maintenance costs

Rust-Chek

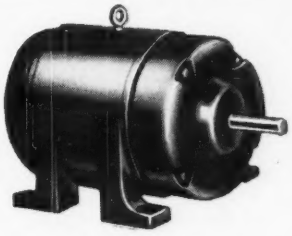
COATING

resists water, salt and fumes

Originally developed, on special request, to stop excessive corrosion of railway track in tunnels, this new type coating is finding ever broadening acceptance as both a product undercoat and for maintenance painting as a 2-coat operation.

Rust-Chek has exceptional resistance to water, salt and acid fumes; retains, through long years of service, unusual qualities of flexibility and adhesion that definitely prevent chipping, cracking or peeling.

Investigate now! Skilled Rinshed-Mason engineers to help you!



For PRODUCT UNDERCOATS

Corrosion-resistant, tough and durable, Rust-Chek is highly recommended as a product undercoat, and especially if the product will ultimately be subjected, in use, to corrosive atmospheres and moisture. *May also be used as a finish coat if high gloss and special coloring are not required.*

For STRUCTURAL STEEL

Bridges or factory structural steel work can be quickly and easily coated with Rust-Chek, adding countless years of life and greatly lengthening time between coats. Rust-Chek puts up a solid front against salt spray, fumes from processing equipment, etc.

Write for DESCRIPTIVE FOLDER

Free Descriptive Folder and specifications will be sent you on request. Test sample will also be forwarded if wanted.

RINSHED-MASON CO.

5935-71 MILFORD AVE., DETROIT 10, MICH.

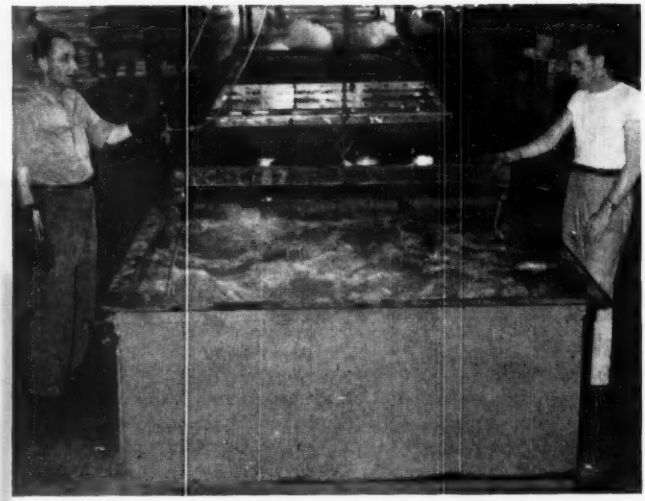


Fig. 1 — Tanks for cleaning and chemically treating surfaces of aluminum parts. *(Photo courtesy Reynolds Metals Company)*

resin molecules have various molecular fields of force about them. Attraction is stronger between a metal surface and strongly polar groups of molecules, so coatings which contain such molecule groupings adhere more firmly to metal than do coatings in which the groups are only weakly polar. It is generally thought that attraction of polar resin molecules to metal is more important in providing adhesion of organic coatings than is mechanical "keying" or locking. Considerable progress is being made in research to relate the composition of organic finishes to their structure and behavior.

Permeability of Finish Affects Adhesion

The permeation of moisture and water through organic finishes may have an adverse affect on the adhesion and performance of the coating. Recent literature (see also Ind. Eng. Chem. 40, 161, 1948) has described a piece of research equipment which has shown considerable promise for evaluating adhesion properties as related to permeability. The equipment is used to measure the electrolytic resistance of protective films on metals and was built to study underwater coatings. Such coatings retard corrosion primarily by reducing the amount of corrosive material which gains access to the metal surface. Therefore, for good protection a coating should be continuous, and should be reasonably impermeable, as well as coherent and adherent to the metal. These properties should be related therefore to the electrolytic resistance of the metal coating in an aqueous environment.

The electrical resistance of films as related to adhesion of the coating was studied by Prof. Marsel, at New York University Laboratories; the results, which were discussed before the Varnish and Paint Chemistry Symposium previously referred to, indicated that it had interesting possibilities for evaluating adhesion. The apparatus used consists of a cell, a protentiometer, and a null indicator. The null indicator registers zero when the voltage supplied by the potentiometer is equal but opposite in sign to the voltage across the test cell. The indicator is a slightly modified Leeds and Northrup thermionic amplifier with a lamp and scale galvanometer.

The electrochemical cell is the following system: metal coating/salt solution/HgC1/Hg. The open circuit po-

Hot Spraying of Lacquer Now a Proved Success!

BEDE PAINT HEATERS

LISTED UNDER UL REEXAMINATION SERVICE — UNDERWRITERS' LABORATORIES, INC.

STOP LACQUER BLUSHING

. . . JUST ONE OF MANY BENEFITS!

ADVANCED *NEW HOT SPRAY PROCESS* BRINGS MANY PROFITABLE BENEFITS; REDUCES TWO-COAT OPERATION TO ONE

With Bede Paint Heaters you can completely stop blushing of lacquers *without the use of expensive retarders!* At the high temperatures produced by Bede Paint Heaters it is virtually impossible to create a blushing condition — and due to the improved flow conditions of the paint, sags, runs and orange peel are greatly reduced. One coat takes the place of two — and the smoothness and depth of film is conspicuously improved.

Bede Paint Heaters have been tested and tried in hundreds of industrial plants. Here's why you'll prefer Bede Paint Heaters:

- FIRST and ONLY Paint Heaters tested and passed by Underwriters — proved completely explosion-proof!
- FIRST and ONLY Paint Heaters using aluminum as the heat transfer agent — eliminating troublesome liquids!
- FIRST and ONLY Circulating Paint Heaters which can draw paint directly from any paint container without a pressure tank!
- RECOMMENDED BY LEADING PAINT MANUFACTURERS.

WRITE TODAY FOR FULL INFORMATION AND FREE DEMONSTRATION IN YOUR PLANT

BEDE PRODUCTS Inc.

INDUSTRIAL FINISHING SPECIALTIES

4311 RIDGE ROAD • CLEVELAND 9, OHIO

WRITE . . . For your Free copy of "The Hot Spray Process . . . Advantages — Causes — Effects" by James A. Bede.

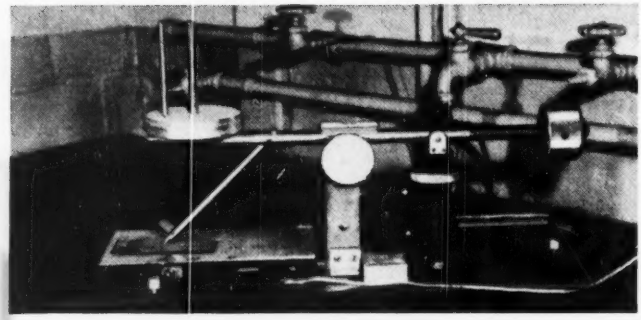


Fig. 2 — Modified Phair adhesion tester developed in laboratories of New York University.

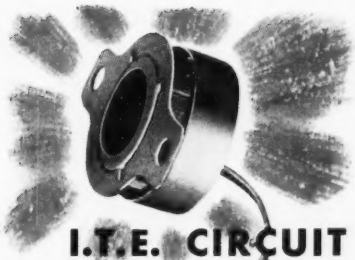
tential of the cell is measured and a known resistance is then connected across the cell terminals. From these values, the internal resistance of the cell, which is essentially the resistance of the coating, can be determined. As an example of the application of this method, in studies on certain films, significant difference in resistance behavior observed after 30 days of immersion appeared to depend upon differences in the ability of the coatings to prevent the spread of corrosion along the coating-metal interface. Differences in resistance behavior were interpreted as due to difference in adhesion obtained at the interface.

Evaluating Adhesion of Organic Coatings

In discussing methods for testing adhesion before the Symposium, Professor Marsel stated that two lines of approach can be followed: (1) evaluation of pertinent properties of the wet film, such as contact angles, surface tension, interfacial tension, and heats of wetting, or (2) direct measurements on the dried film. Measurements on the dried film are more simple and direct; however, these measurements are for the most part never solely functions of adhesion alone. These adhesion tests were classified into the following five general catagories: (1) tensile methods; (2) scratching or gouging tests; (3) base deformation tests; (4) impact tests; (5) miscellaneous tests.

A modified Phair scratch adhesion tester (see Fig. 2), developed in the New York University Laboratories, was found to be simple, quick and easy to use. It was stated that the machine, which was originally developed by Dr. R. J. Phair of the Bell Telephone Laboratories, is used to evaluate adhesion by placing a test panel on a movable table and pushing it beneath a rounded stylus mounted at an angle of 45 deg. in a pivoted beam. The beam can be increasingly loaded with weights in increments of 500 grams until the film is stripped or until the maxium weight of 5500 grams is reached. In the improvements made, manual pushing was changed to automatic operation by a gear rack and small electric motor. Also, a specially mounted ivory blade was used for a stylus, which was uniformly sharpened before each run. Table II shows representative adhesion values obtained with the instrument on different types of surfaces.

In further discussion of the testing of finishes, Prof. Marsel pointed out that the simplicity and practicability of the conical mandrel test makes it a very valuable one, and it was considered advisable to investigate its use more critically with a special effort toward adhesion evaluation. This test is a modification of the original mandrel test which involved bending test strips over six mandrels of varying diameters. The instrument uses a cone on the assumption that the degree of bending at a given diameter on the



Udylite
JUNIOR AUTOMATIC
gives increased production...
more uniform plating for

I.T.E. CIRCUIT BREAKER COMPANY

This Udylite Junior Automatic Plating Machine cleans and plates television receiver parts for I.T.E. Circuit Breaker Company. Uniform finish is essential to precision parts like this.

THE plating department of I.T.E. Circuit Breaker Company, Philadelphia, reports splendid performance by their Udylite Junior Automatic plating machine. Used primarily for finishing television receiver components—this Udylite unit incorporates BOTH cleaning and plating in ONE operation. The results are: greater quantity and improved quality of production with lower direct labor costs.

You can reap these same rewards in your plant with Udylite equipment. Call in your Udylite Technical Man and let him analyze your operation and make recommendations for bigger plating profits for you. Or write to The Udylite Corporation, Detroit 11, Mich. There's no obligation.

THE
Udylite
CORPORATION
DETROIT 11, MICHIGAN

Pioneer in Better Plating

TABLE II

Values Obtained in New York University Laboratories Using the Modified Phair Adhesion Tester.
Curing Conditions—3 hours at 121 deg. C.

METAL TESTED	Film Thickness mils	Failure Load grams
Steel, untreated	1.9	1000
Steel, phosphate-coated	1.9	2000
Steel, phosphate-coated	2.0	5500
Aluminum, untreated	1.9	1000
Aluminum, phosphate-coated	2.1	2500

cone is equivalent to the bend that would result if the specimen was tested on a cylindrical mandrel of the same diameter. The point of maximum elongation is measured. The mandrel test gives results which are mainly a function of the distensibility and flexibility of the coating. However, if the composition and thickness of the paint film be kept constant, and the type of metal surface varied, the results should indicate a qualitative consideration of adhesion. Figure 3 illustrates use of the method for measuring distensibility of coatings in the Bell Telephone Laboratories.

This investigation was also encouraged by the observation that identical paint films on different surfaces showed different values of elongation failure. At these points the force of elongation just exceeded the force of adhesion. Thus, if it was possible to obtain numerical values for the force of elongation at the failure point, it should equal the adhesion value. It was pointed out that the numerical value for a particular per cent elongation can be obtained by a stress-strain diagram, such as are shown in Fig. 4. In other words, according to Prof. Marsel, one determines the point of failure of a paint film from the conical mandrel tests as a certain per cent elongation. From the stress-strain diagram, one can find the corresponding numerical value of stress. If the film has failed in adhesion, that

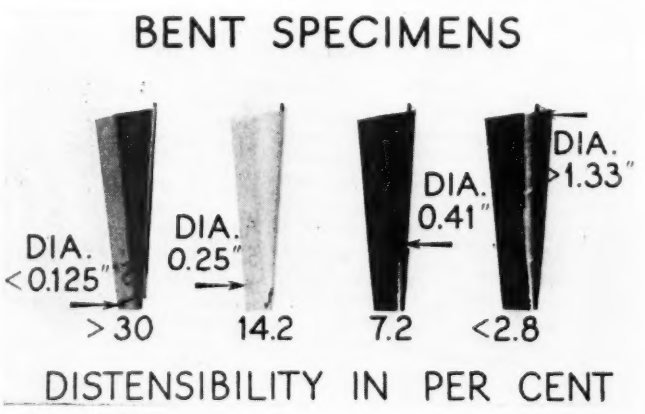
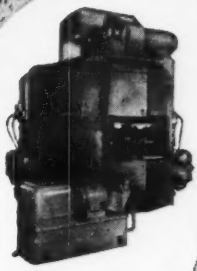
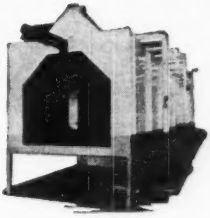


Fig. 3 — Test specimens showing distensibility of organic coatings when subject to Bell Telephone Laboratories' mandrel test. If the composition and thickness of the paint film are kept constant and the type of metal surface varied, bending results from a test such as this can indicate a qualitative consideration of adhesion.

Complete finishing Systems





A Continuous Process is no stronger than its Weakest Link . . . . . .

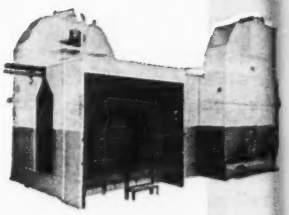
Every component **SPRAY BOOTH, FLO-COAT MACHINE, OVEN or WASHER**

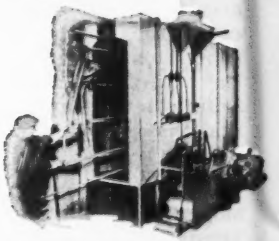
receives the same careful attention . . . .

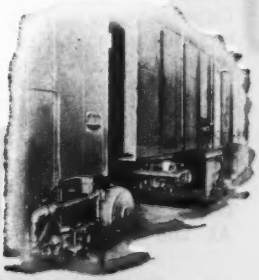
Only Thoroughly Tested features are incorporated in P-D equipment . . . . . .

We invite you to inspect our latest installations

Write, Wire or 'Phone







PETERS-DALTON Inc.

17914 RYAN ROAD • DETROIT 12, MICHIGAN

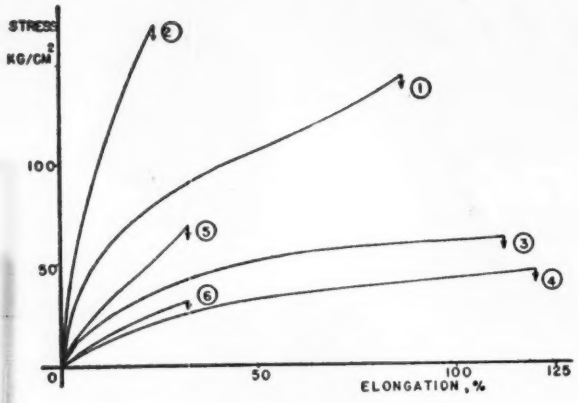


Fig. 4—Stress-strain curves for various paint films.
Curve 1—Alkyd resin
Curve 2—Linseed oil-cresol modified varnish
Curve 3—Linseed oil-phenol modified varnish
Curve 4—Linseed oil-phenol modified varnish
Curve 5—Blown linseed oil-lithopone
Curve 6—Raw castor oil-carbon black

is, failure below the normal failure on the stress-strain diagram, this numerical stress value should correspond to the value of adhesion, or the point at which the force of elongation just exceeded the force of adhesion.

It was emphasized that further problems remain to be solved in using this method. Aside from the mandrel test itself, it is necessary to determine the equivalence of data on failure of a free paint film and a film failure on the mandrel. Also, problems arise when the force of adhesion exceeds the normal failure point by elongation. Other important points are the accurate location of the point of failure on the mandrel. Indications are that the electrographic printing method may be used to advantage here.

Other recent developments in adhesion testing include an instrument devised in the Interchemical Corporation Laboratories. The tester consists of a base plate on which is fastened the test panel. The base plate is pulled under a weighted ivory blade knife-edge, which is connected by means of a beam and wire to a pendulum. As the plate moves forward, the pendulum weight is raised, thus producing a backward pull on the test specimen. At the moment the backward pull equals the forward thrust exerted by the coating, the knife begins to remove the coating, and the thrust is measured by means of an Ames dial.

Another method is based on a centrifugal test using a steel ball which is rotated in a vacuum at high speed. The ball, slightly flattened, with a diameter of 0.25 inch and weight of 1.5 grams, has a dot of paint placed on it, and spins at a surface speed of 1800 mi./hr. Eventually, centrifugal force strips off the paint. Dr. Moses, working at the U. S. Naval Research Laboratories, has developed a method for quantitatively measuring adhesion by the use of longitudinal ultrasonic vibrations. The vibrations are produced in a metal cylinder and the organic coating which is attached to the free end of the vibrating cylinder separates from the metal when the force due to acceleration exceeds the adhesional force at the surface. The accelerating force can be determined knowing the frequency and amplitude of vibration and dimensions of the film.

* * *

Passivity in Chromium Plating Operations

ADVICE to platers on how to avoid production losses from passivity in

LOOK GOOD?

Barbecued chicken a la Johnson really IS good!

. . . It's good for the Kirker Chemical Company, makers of the attractive, protective enamel which caught Mr. Johnson's eye and caused him to consider the "Campick" grill *first.*

. . . It's good for Jack's Hardware on South Avenue, which displays the "Campick" grill prominently in its window. Jack expects to show a tidy profit on this item.

. . . And it's good for the Wallkill Machine Works, Inc., of Walden, N. Y., manufacturers of this popular grill, who depend upon Kirker for finishes which sell the "Campick" and keep it sold!

Your product, too, will move faster under a Kirker finish custom built to your specific requirements.

KIRCO MODERN COATINGS

Kirker CHEMICAL COMPANY

ONE EAST ELEVENTH STREET • PATERSON 4, NEW JERSEY

chromium plating over nickel was given by R. O. Hull and J. B. Winters, R. O. Hull & Company, as a part of a general discussion on operating characteristics of chromium plating baths before last year's convention of the American Electroplaters' Society. Elevation in the bath temperature of even 10 deg. F. tends to cause passivation on the chromium bath.

In plating chromium over nickel, the cold water rinsing cycle should not total more than two minutes. Also, it was recommended that time in the chromium bath before current is applied should not exceed 15 seconds. If bright nickel plated parts are to be chromium plated, using the concentrated chromium bath, they should be transferred rapidly from the bright nickel through a short cold water rinse, followed by a 20-40 second dip in 5 per cent by weight sulfuric acid, and a second rinse; then chromium plated with immediate electrical contact. Where delayed contact in the chromium bath is inevitable, as in some full automatic plating machines, chromium-bath passivation may result in poor coverage or rainbow plate on work carried on the lower parts of racks. In such cases the sulfuric acid dip is necessary.

For plating buffed gray nickel or bright nickel which has stood around for some time the following cycle was recommended by Hull and Winters for use with either the strong or dilute chromium plate.

1. Clean cathodically to remove buffing compound and activate in a suitable alkaline cleaner.
2. Immerse in water for 5 minutes.
3. Dip quickly in 5 per cent by weight sulfuric acid if the 33 oz./gal. chromic acid bath is to be used.
4. Rinse quickly and plate in the chromium bath.
5. If the 54 oz./gal. chromic acid bath is employed, use above operations but instead of the 5 per cent dip use a 300 g./l. sulfuric acid dip followed by thorough rinsing to avoid sulfate buildup in the chromium bath. In this procedure, there is no critical concentration of chromic acid; the minimum should be used to secure the required current at the available voltage.

BOOTHCOTE

cleans spray booths quickly, economically, safely!

Spray Boothcote on clean booth. Surplus paint can then be peeled off in sheets by any operator.

- Saves time and labor
- Time-tested; used for 11 years
- Mixed—ready to use

- Can be brushed or sprayed
- Non-inflammable; safe to store
- Does not flake off

Money back trial offers: 5 gals. $6.25 f.o.b. Buffalo or write for Circular.

Distributors! Write for open territories.

HYGRADE FOOD PRODUCTS CORP.

Boothcote Div., 19 Stetson St., Buffalo 6, N. Y.

"Schaffner's Makes Things Shine!"

SMART OPERATORS

...BUY NEW EQUIPMENT WITH THE SAVINGS REALIZED FROM USING SCHAFFNER'S TAILOR-MADE COMPOSITIONS...

SAVE!

STAINLESS COMPOUND

21¢ LB.

F.O.B. OUR PLANT

OFFER EXPIRES JULY 31, 1950

Schaffner's Buffing Compositions

Dealers and jobbers wanted

Schaffner Mfg. Co., Inc. Emsworth, Pittsburgh 2, Pa. Rosewood 1-9902

Now you can get...

BETTER FINISHES, BROADER USAGE

for **ZINC AND CADMIUM**

with

IRIDITE

for

CORROSION RESISTANCE, PAINT ADHERENCE, FINAL FINISH... BRIGHT, CHROME-LIKE OR COLORED

The only complete line of patented chromate-dip treatments to meet your particular finishing problem.

Iridite *quality* is *tops* in corrosion resistance and paint bond. Iridite finishes are *first* in wide selection of coatings:

BRIGHT: Chrome-like in appearance

BRONZE: Natural as bronze itself

OLIVE GREEN: A popular replica of Military Olive Drab.

HUE BRITE: Clear; eye-appealing iridescence

COLORS: Black, Red, Blue, Green

PROCESS METHOD: Simple dip chemical immersion for a matter of seconds

SURFACES: Zinc or cadmium: plated, die cast, galvanized or sheet

COST: The smaller fraction of a penny does a square foot of surface

FREE—Write for literature and samples, and for immediate action, send us a sample of the product you wish to process, along with the outline of your problem.

SPECIAL PROCESSES—*Research and new developments in general metal finishing are being carried forward as manufacturers present new finishing problems for us to work out.* ***Let us go to work on yours.***

IRIDITE LICKED THESE FINISHING PROBLEMS—Washing Machine Parts • Radio Equipment • Kitchen Utensils • Aircraft Parts • Lock Hardware • Office Machines • Window Frames • Vending Machines • Tools • Lamp Fixtures • Fuel Pumps • Carburetors • Auto Hardware • Zinc Coated Sheet • Hinges, Screws, Bolts • Camera Parts • Plumbing Fixtures • Wall Panels • Refrigerator Parts • Wire Products • Instrument Parts • Electrical Equipment • Armed Forces Materiel.

ALLIED RESEARCH PRODUCTS, INC.
4004 EAST MONUMENT STREET
BALTIMORE 5, MD.

West Coast Licensee—L. H. Butcher Co., Los Angeles 23, Cal. • Other Licensees in So. Africa, So. America, Australia

PRACTICAL APPLICATIONS *of Modern Products*

Infra-Red Oven Removes Grease From Floor Furnace Parts

AT Lawson Manufacturing Company, Pittsburgh, an improved method has been found to degrease sheet metal parts used in the manufacture of floor furnaces. All-metal electric radiant heaters are used for the purpose, and conveyorizing the operation has eliminated excess handling.

Fig 1 — Parts are attached to the conveyor for the 36-second trip through the oven.

Degreasing 31 x 20-inch sheet metal parts is now done rapidly on a continuous conveyor which carries the parts without interruption through a space-saving infra-red oven that removes all traces of oil in thirty-six seconds. The oven consists of two banks of nine vertically mounted 3.6 kw. Chromalox Radiant Heaters, each bank with a heater at the base mounted on a 45-degree angle to increase the temperature on the bottom edge of the work. Total installed capacity is 72 kw. The heated section of the oven is approximately three feet long and the conveyor moves at five feet per minute.

During the thirty-six seconds the parts move between the heater banks, the temperature rises and vaporizes the oil coating. Emerging from the oven the parts proceed to the next operation. An additional economy factor is the oven's 2-minute heat-up time which permits the use of heat only as needed.

The oven's efficiency was increased by insulating the space behind the heaters with glass wool. Overhead a

CODMAN

FOR OVER
55 YEARS
THE GREATEST
NAME IN BUFFS

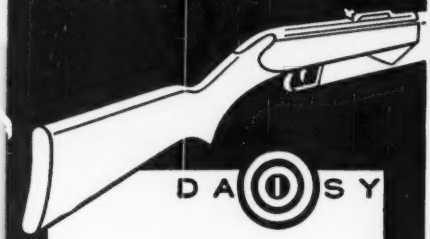
F. L. & J. C. **CODMAN** COMPANY

ROCKLAND, MASSACHUSETTS

Branch Offices: DETROIT • LOS ANGELES • GRAND RAPIDS • PHILADELPHIA • INDIANAPOLIS

Daisy

LIKES LACQUER BEST BECAUSE . . .



. . . lacquer helps get the range on buyers. Lacquer contributes its own rich gloss to the sales-appeal of Daisy Air Rifles and Guns.

Lustrous lacquer is not only attractive . . . it's durable. After 12 to 13 years' use, exposed copper-plated and lacquered pieces returned to Daisy Manufacturing Company for reconditioning were found to be still in remarkably good condition. Daisy attributes this entirely to the original coating of hardy lacquer.

In production, too, lacquer scores a bullseye. Fast drying, it helps Daisy speed finishing of wooden stocks and other parts . . . keeps coating costs to a minimum.

HERCULES POWDER COMPANY
INCORPORATED
927 Market St., Wilmington 99, Del.

HERCULES DOES NOT MANUFACTURE LACQUERS, ONLY THE DERIVATIVES FROM WHICH THEY ARE MADE

LACQUER HELPS YOU SELL

CL-50-19

hood and a low volume fan were mounted to remove exhaust from the building.

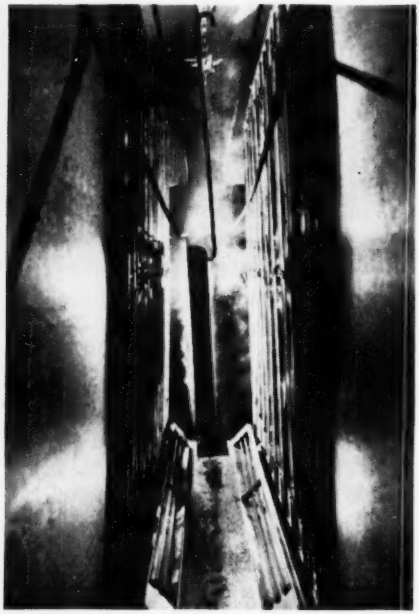
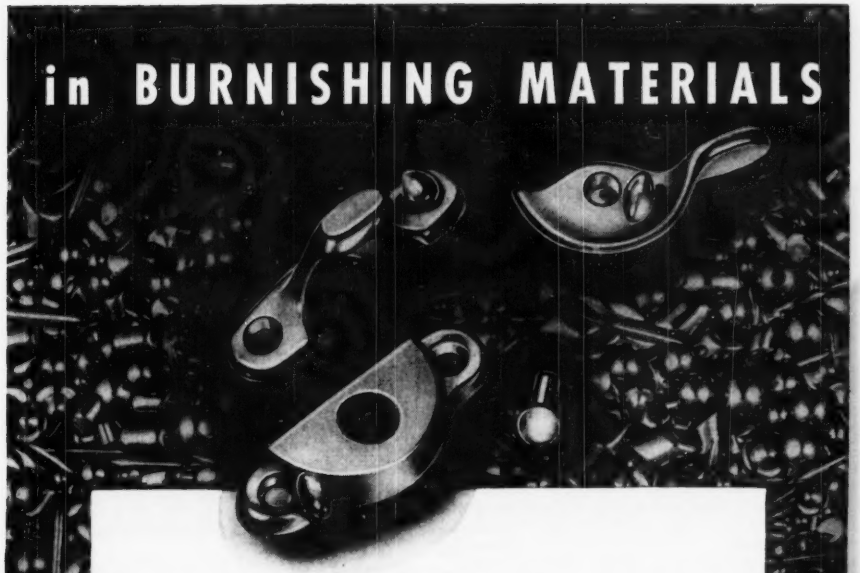


Fig. 2—Grease vaporizes before intense heat generated by the infra-red heaters.

Reduced labor costs, greater efficiency and more uniform degreasing are among the advantages Lawson lists for the Radiant Heater application. Heating units for the installation were supplied by Edwin L. Wiegand Company, 7552 Thomas Boulevard, Pittsburgh 8, Pennslyvania.

Chemically Resistant Pipe and Fume Ducts. Bulletin 1J, "Permanite Pipe and Fume Ducts," is being offered by the Maurice A. Knight Co., Kelly Ave., Akron 9, Ohio, describing and illustrating items made of glass-fabric-reinforced furan-resin materials, including connections and fittings. Physical properties and resistance to a variety of chemicals are given.

in BURNISHING MATERIALS



it's the SHAPE that counts!

Smooth burnishing of rounded corners, undulating curves, deep depressions and rounded projections is the special job of Abbott Ovalballs. They're shaped to do the job right!

Abbott Burnishing Materials, available in five shapes . . . Ball, Ovalball, Cone, Diagonal, Pin . . . are scientifically designed to make effective contact on metal stampings or castings of any size and shape. Each piece is a burnishing tool made from Abbott high quality bearing ball steel. Each is deep hardened and polished to a mirrorlike, glass-hard finish. For the *best* burnishing results . . . use Abbott!

Some parts require a special mixture of Abbott Burnishing Shapes. Send for catalog . . . No obligation.

ABBOTT
the all round ball

THE ABBOTT BALL COMPANY
1054 New Britain Ave.,
Hartford 10, Conn.

NEWS of the Industry

NEW PLANTS

THE KIRK & BLUM MANUFACTURING CO., Cincinnati, Ohio, has purchased all real estate and property of the Cincinnati Planer Co., Oakley, Cincinnati, Ohio. The property consists of eight acres of land and eleven buildings having a combined floor area of approximately 110,000 square feet served by overhead power cranes, with railroad switching facilities running into the main building.

The new owner announced that general offices and engineering departments would be located in a two-story air-conditioned building in the front and that operations and warehousing facilities located throughout Cincinnati would be consolidated.

Kirk & Blum was founded in 1907 by the late Sylvester W. Kirk and Richard J. Blum as a sheet metal shop, specializing in the design, fabrication, and installation of dust collecting systems for industrial plants. In 1939 the company was selected as the pilot plant for initial production and development of production techniques for Army field ranges.

Today, Kirk & Blum has made thousands of dust collection installations, and is handling the work of the new Ford Motor Company plant in Cincinnati.

The Pacific Coast plant of **PARKER RUST PROOF COMPANY**, manufacturer of Bonderite, Parco Compound, Parco Lubrite, and other metal preparation and cleaning products, is now in operation at 3710 Fruitland Ave., Maywood, California. Warehousing of the entire Parker line at the new plant allows prompt service and shipments to the metalworking industries on the Coast.

Manager of the Maywood plant is S. N. Headlee, who has been Parker's Pacific Coast regional manager for the past several years.

THE DeVILBISS COMPANY, manufacturer of air compressor outfits and spray painting equipment, will soon establish a modern manufacturing plant in Somerset, Pennsylvania, it was announced at the company's general offices in Toledo, Ohio.

COMPANIES

A 600-foot long galvanizing line which makes it possible to continuously heat treat and galvanize coils of cold rolled steel sheets has been completed at Gary Sheet and Tin mill of **CARNEGIE-ILLINOIS STEEL CORPORATION**, a U. S. Steel subsidiary.

Much brighter finishes in a tight-patterned spangle are produced on sheets rolling off this line, which is capable of galvanizing coils of steel at a rate of 300 feet per minute in widths up to 48 inches.

The annealing or heat treating furnace—an integral part of the new line—is heated by electrical elements much like the ordinary toaster. Coiled steel passing through the furnace emerges directly into a bath of molten zinc. Replacing the older, conventional method of galvanizing sheets the line boasts an annual production capacity of 60,000 tons.

Theme of the recent sales clinic conducted by **COWLES CHEMICAL CO.**, Cleveland, Ohio, was "Buffing Compound Removal Was A Tough Job!" Pictured in the photo are members of Cowles' Metal Cleaner technical staff who participated in the discussions and demonstrations. Formal announcement of a series of new Cowles products spe-

Reading from left to right (seated): Fred H. Hitchcock, John W. Dobson, Robert L. Smith, M. P. Boland, and Norman E. Garman; (standing): J. A. Barnes, Clyde E. Lowe, E. A. Lord, Technical Director C. W. MacMullen, Manager E. F. Clark, Charles W. Churchill, and C. G. Ozar.

cifically designed for efficient buffing compound removal was made at the clinic. Technical Director C. W. MacMullen, M. P. Boland, and C. G. Ozar conducted a series of technical discussions, and E. F. Clark, manager of the Metal Cleaner Department, led the discussions on sales problems and policies.

Gerald Kraft, sales manager of Kraft Chemical Co., Chicago 8, Ill., has announced that the company has been appointed Midwest sales representative for **BETTER FINISHES & COATINGS, INC.,** Newark, N. J., manufacturer of paint, plastic and chemical products.

Kraft, distributor of industrial chemicals of all types throughout the Midwest, will carry substantial warehouse stocks of the Better Finishes line in Chicago, Detroit, and at other key points.

James E. Weaver has announced the organization of the **WEAVER EQUIPMENT & SUPPLY CO.,** Mayborn Dr., Temple, Texas, which will supply finishishing materials to the States of Texas, Oklahoma, Arkansas, and Louisiana. The service will include consultation, layout, analysis, and supply of equipment, processes, and chemicals.

Mr. Weaver has spent 15 years in the plating field, including work at the National Cash Register Company and the Hickok Manufacturing Company. In Rochester he aided in the inauguration of a metal finishing course at Rochester Institute of Technology, and taught electroplating at that school.

Among the companies represented by Weaver Equipment & Supply Company are Enthone, Inc., Roto-Finish Company, and Williamsville Buff Division of the Bullard Clark Company.

The **TRUMBULL ELECTRIC MANUFACTURING COMPANY** of Plainville, Connecticut, has announced the sale of its Raymersion oven business to **JENSEN SPECIALTIES, INC.,** Detroit, Mich. Raymersion was the trade name given to Trumbull's infra-red oven heating process. In the terms of the sale, the Jensen organization has accepted the responsibility of servicing all existing installations previously manufactured and sold by Trumbull.

Paul H. Goodell, who was previously associated with Trumbull as manager of Raymersion Oven sales, is now employed by Jensen Specialties.

THE ELECTRIC PRODUCTS COMPANY of Cleveland, Ohio, has appointed the Muth-Richards Company as its representative in the State of Washington and the panhandle of Idaho.

With offices in Seattle, Washington, the Muth-Richards Company will handle all the industrial lines of The Electric Products Company.

The **PENNSYLVANIA SALT MANUFACTURING COMPANY** has announced the opening of a district sales office at 1114 Buhl Bldg., 535 Griswold St., Detroit.

Harry G. Potts, district sales manager of Pennsalt's Heavy Chemicals Department, will be in charge. Also making their headquarters there will be W. B. Adam, Heavy Chemicals sales representative, and Willis J. Stoddard of the Special Chemicals Department.

With the opening af the Detroit office, Pennsalt is discontinuing its former sales office at its Wyandotte plant. Other sales offices are maintained in Philadelphia and Pittsburgh, Pa.; Paterson, N. J.; Cincinnati, Ohio; Chicago, Ill.; Appleton, Wis.; Bryan, Texas; Los Angeles, Calif.; Portland, Ore.; and Tacoma, Washington.

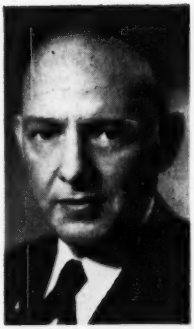
Two of the leading German authorities on the cold extrusion of metal were in Detroit recently, exchanging information on developments in this field with members of **PARKER RUST PROOF COMPANY** staff.

Dr. I. W. Overath, technical director, and Dr. H. R. Ley, director of chemical laboratories, Metallgesellschaft, A. G., in Frankfurt a. Main, spent two weeks in Detroit in sessions with Dr. Robert Gibson, Parker's technical director, and J. F. Leland and H. J. McVey, Parker development engineers.

Metallgesellschaft has been the owner of the original German rights to Parker Rust Proof Company's product, Bonderite, for the last 20 years. Since 1946, it has further developed the technique of treating and lubricating with the employment of Bonderite and now has many applications in peacetime production.

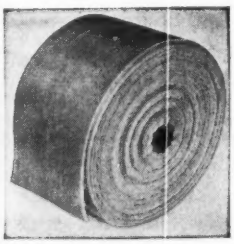
NEW POSITIONS

The appointment of **ROY D. BECK** as manager, Ceramic Division, of the Binks Manufacturing Co., Chicago 12, Ill., industrial finishing equipment manufacturer, has been announced by Burke B. Roche, president. Mr. Beck's first task in his new position will be the further expansion of the Ceramic Division, making possible greater assistance to ceramic and porcelain enamel finishers.



Roy D. Beck

A registered professional engineer, Mr. Beck is a graduate of Ohio State University where he obtained degrees in ceramic engineering. He was recently in charge of all finishing in the domestic appliance division of the Pressed Steel Car Co., Chicago, Ill., where he designed and directed installation of the finishing departments. He has been associated with Westinghouse Electric and Mfg. Company in both the enameling division and the engineering department.



IN ROLLS
Cut off any size piece and use as needed.

CUT BULK
Already cut and folded, ready to use.

NOW! Tack Cloth in Handy Rolls or Cut Bulk

Now you can get Tack Cloth packed the way it's easiest for you to use—either in 150 yard rolls of 36" wide cloth or in handy cartons—100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will *stay* SOFT and TACKY until the very last bit is used up.

The Cut Bulk size is 18" x 36"—folded to 4½" x 18" for easy handling. *All of our Tack Cloth is Spontaneous Combustion-Proof, Lint-Free and Wax-Free.* It's clean and sanitary—*there's no waste.*

Write today for complete information, prices and samples.

BAUGHN CHEMICAL PRODUCTS CO.

The Tacky Wiper Specialists

7019 N. Ravenswood **Chicago 26, Ill.**

Also Individually Packed in Glassine Envelopes—144 to the Carton

— A WARRANTY OF SATISFACTION IN EVERY CARTON —

Harry M. Platt

Ferro Enamel Corp., Cleveland, Ohio, has announced the appointment of **HARRY M. PLATT** as sales representative in eastern Pennsylvania. His duties will include the sale of ovens, dryers, metal cleaning machines, and complete synthetic finishing departments.

Mr. Platt is a graduate mechanical engineer from the University of Pennsylvania, and was formerly associated with public utility companies in the Philadelphia area as an engineer and sales manager.

GEORGE R WEBER was elected treasurer of Raybestos-Manhattan, Inc., Passaic, N. J., at the annual meeting of the board of directors recently, succeeding **W. H. DUNN,** who has retired. **W. S. SIMPSON** was elected secretary and **W. WARD KIEVIT** director of the corporation.

In addition to his new responsibility, Mr. Weber has been a director and vice president of Raybestos-Manhattan, Inc. since its formation in 1929 and is also general manager of the United States Asbestos Division, Manheim, Pennsylvania.

Mr. Simpson, recently appointed assistant general manager of the Raybestos Division, Bridgeport, Conn., has been a director for two years.

Mr. Kievit, who makes his headquarters at the main office, has been secretary since 1946 and comptroller since 1948. With his added duties as a director he has relinquished his duties as secretary.

According to a recent announcement by R. A. Stulz, president of De Luxe Hard Chrome Service, Detroit, Mich., **BUCK M. ROGERS** has been appointed general sales promotion manager. He formerly was associated with the sales department of the Liberty Highway Company.

De Luxe Chrome processes tools, dies, and gages.

George Kern, assistant to the president of Gates Engineering Co., New Castle, Del., has announced the appointment of **L. J. AMSDELL** as director of the Pipe Joint Division. His duties will include sales direction of the Gaco Pipe Joint System, which is used by chemical process industries in conjunction with rubber-lined pipe.

Mr. Amsdell joined Gates Engineering after being with Goodyear for 18 years.

Laurence S. Watson, president of Apex Chemical Mfg. Corp., Detroit 8, Mich., manufacturer of alkali and emulsion cleaners, has announced the appointment of **JOEL N. COOPER** as sales manager of Industrial Cleaning and Chemical Sales.

Mr. Cooper, formerly with Detrex Corporation, is well known for his contributions in alkali and emulsion, as well as solvent vapor degreasing.

ROBERT H. HEPPEL has been appointed to head the Dallas operation of Davies Supply and Manufacturing Company, exclusive distributor in the Southwest for the Udylite Corporation, manufacturer of plating equipment, supplies.

Mr. Heppel will be in charge of the sales and service departments of the Davies organization's new Dallas warehouse, located at 301 N. Market Street.

Prior to joining Davies, Mr. Heppel, holder of a B.S. degree from Carnegie Institute of Technology, was with the Detrex Corporation, Detroit, for ten years and the Dravo Corporation, Pittsburgh, for four years.

Robert H. Heppel

The Acme Manufacturing Co., Detroit, Mich., manufacturer of automatic polishing and buffing machines, has an-

Arthur H. Losey

nounced the appointment of **ARTHUR H. LOSEY** as sales engineer for its entire line.

Mr. Losey has spent 25 years in the metal finishing industry. Prior to his association with Acme, he was district sales manager in the Cleveland area for Frederic B. Stevens, Inc.

Mr. Losey will also be in charge of the processing department which the company has recently installed in its new plant. This department provides for a complete display of all types of automatic buffing equipment under power, and is to be used for determining the best sequences of operations for automatically finishing all types of materials, as well as for operating demonstrations to buyers. Straight line, rotary semi-automatic, and special machines will be set up on the display and demonstration floor.

The appointment of **PAUL C. HURLEY, JR.**, as manager of Pennsylvania Salt Manufacturing Company's newly created Sales Promotion Department has been announced by William P. Drake, vice president in charge of sales. As head of the department, Mr. Hurley will be in charge of advertising, promotion research, and the company's salesmen-training program.

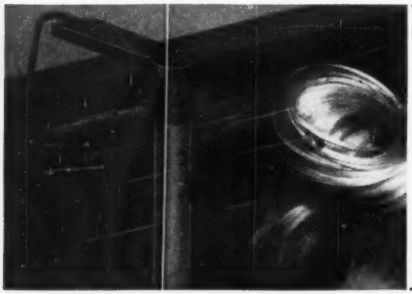
Coming to Pennsalt in 1943 as a salesman in the Laundry and Dry Cleaning Department, Mr. Hurley held positions in that division as district sales manager and merchandising manager before becoming attached to Mr. Drake's staff a year ago. During the war he served as a Civilian Instructor for the U. S. Army Air Corps at the Advanced School for Specialized Mechanical Training operated by TWA.

Frederic B. Stevens, Inc., of Detroit, announces the addition to its sales organization of **GEORGE D. STEVENSON.**

Mr. Stevenson has an unusually diversified business background, having spent some time with Bethlehem Steel Corporation on production work processing sheet steel; production work on industrial ceramic for Buffalo Electro-Refractories Corporation; five years with the Food Products Division of Beech-Nut Packing Company; a brief time with Fisher Body Corporation on methods and time study covering medium to heavy machine shop practice; and similar work for the Addressograph - Multigraph Corporation. For the past six years he was associated with the Grand Industries, Inc., as industrial engineer.

George D. Stevenson

ROBERT C. MEDL has joined the staff of the Quaker Chemical Products Corporation at Conshohocken, Pennsylvania,



ELECTRIC IMMERSION HEATER FOR CORROSIVE SOLUTIONS

The Amersil Heater consists of an outside shell of corrosion resistant fused quartz, containing a heating element of nichrome wire. Available in a variety of shapes and sizes.

Write for complete details.

AMERSIL COMPANY INC.
900 PASSAIC AVE. EAST NEWARK, N. J.

(Left to right) Dr. George P. Swift, co-chairman of the 1950 Convention, who introduced the following founder members: George B. Hogaboom, Edward W. T. Faint (at rostrum), John E. Sterling (partially hidden by Mr. Faint), Charles A. Cooper, W. J. Schneider, Horace H. Smith, and Thomas A. Trumbour.

as technical director. He was previously vice president and technical director of the McCormack-Medl Corp., Camden, N. J., manufacturer of surface coatings.

HONORS

At the **37TH ANNUAL CONVENTION** of the **AMERICAN ELECTROPLATERS' SOCIETY,** held in Boston, June 12-15, a number of founder members were honored at the opening business session. Several members of the group are past national presidents of the Society; namely, George B. Hogaboom (first president, 1914), John E. Sterling (1924), and Horace H. Smith (1929). Mr. Hogaboom, Mr. Sterling, and Mr. Smith are also honorary members of the Society.

TADEUZ SENDZIMIR, vice president of Armzen Company and the inventor of the Sendzimir process of continuous galvanizing, was the recipient of the first annual award of The Galvanizing Committee, which is sponsored by the American Zinc Institute, at the dinner session of the 23rd meeting of the Committee which was held in Toronto, Canada. The presentation of a bronze plaque marked the award to Mr. Sendzimir for fundamental achievements in the art of galvanizing sheets.

Mr. Sendzimir, who was born and educated in Poland, moved to Shanghai, China, in 1918 where he developed his basic idea of continuous galvanizing without pickling

The Chicago Vitreous Enamel Company's "quarter-century" club gained four new members on April 30 when the following employees were presented with gold watches by F. L. Meacham, vice president and general manager, at the Chicago Vit Bowling League banquet: Fred Waarich, Stanley Rykaczewski, (Mr. Meacham), Eddie Urbanek, and Joe Malacek.

or fluxing, his first experiments being carried out on wire. In 1929 he came to the United States and then returned to Europe where his work was extended to strip coatings. In 1935, in conjunction with the Armco Steel Corporation, the Armzen Company was formed for furthering his inventions.

It is the purpose of The Galvanizers Committee to present a similar award each year in recognition of distinguished service and valuable contributions to the galvanizing industry or related field.

Forty-six employees of **MANHATTAN RUBBER DIVISION,** Raybestos-Manhattan, Inc., Passaic, N. J., who completed 25 years with the company during the past year, were honored recently at the Sixth Annual Dinner of the Manhattan Pioneers. The new members joined a group of more than 600 employees with services running from 25 to 57 years. The 46 new Pioneers received gold lapel buttons, while members entering new five-year groups were presented with additional diamond studs.

John F. D. Rohrbach, president of Raybestos-Manhattan, Inc., was the principal speaker. Other speakers were John H. Matthews, vice president; Harry V. Snyder, factory manager; and Harry E. Smith, vice president.

WILLIAM J. SPENCE, Massachusetts sales representative for The Egyptian Lacquer Manufacturing Company, was the guest of Sales Manager Philip H. Beach, at a special dinner held in his honor recently at the New York Athletic Club. The occasion was the completion by Mr. Spence of twenty-five years of service with Egyptian.

William J. Spence

Mr. Spence received a congratulatory gift of a gold watch from O. J. S. deBrun, president of the company.

The ten guests present represented a total of almost 400 years of service with the company.

Industry's 3 Newest

COLD STRIPPERS

Fast! Economical! Safe! New!

"UNISOL"—for removing all baked enamels! Used cold—Non-inflammable —Non toxic—Strips baked enamels in seconds—Used for all type metals—Requires no rinse—Non-injurious to hands or clothing.

"UNISOL No. 2"—A new cold stripper for japans and vinyls—Non-inflammable —Strips tough japans and vinyls in matter of minutes—Used for all type metals.

"STRIPPER 202"—Something new for removing "stop-off" lacquers in seconds —Will not tarnish highly polished metal surfaces—Non-inflammable —Used cold—Non toxic.

Samples and further information supplied on request.

CHEMCO PRODUCTS CO., Inc.

7740 WEST 47TH STREET **LYONS, ILLINOIS**

TRAINING COURSES

The **FEDERATION** and the **AMERICAN OIL CHEMISTS' SOCIETY** are jointly sponsoring a short Course in Drying Oils Technology at the University of Minnesota during the week of August 7-11, 1950. Emphasis will be placed on the practical aspects of the subject, with expert speakers from the industry dealing with various phases of the production, processing, and use of drying oils. The best current practice, rather than theory, will be stressed.

The capacity of the Institute for Continuation Studies at the University of Minnesota is limited, and will not exceed 100 students. Registration fee will be $25.00 for those employed in industry and $10.00 for college students. Requests for information, registration, and other inquiries should be addressed to Fred Berger, Institute for Continuation Studies, Minneapolis, Minnesota.

This group, recently enrolled at the DeVilbiss Company's school of spray painting, assembled for a photo on the lawn at the company's plant in Toledo, Ohio. The young woman, shown near the middle of the picture, participated in the week-long course of instruction in industrial and automotive finishing techniques, as she is associated with her husband in a welding and auto refinishing business and plans to take an active part in car finishing and auto body maintenance.

The DeVilbiss Training School schedule for the remainder of this year offers a choice of five different weeks of instruction. These starting dates are: July 31, August 21, September 25, October 30 and November 13. Applications are invited as far in advance as possible. Enrolees pay only for meals and lodging while attending the school, as there is no charge for instruction. Applications and inquiries should be sent to the DeVilbiss Co., 300 Phillips Ave., Toledo, Ohio.

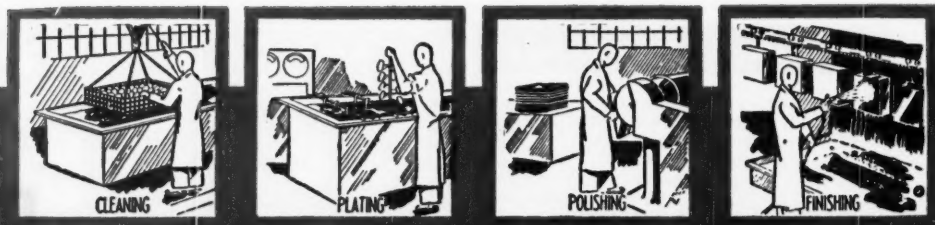
MEETINGS

The **DETROIT BRANCH** of the **A.E.S.** has completed plans for its **ANNUAL STAG DAY,** to be held on July 29, 1950, at the Forest Lake Country Club. The chairman, Walter Pinner, has chosen the same committee which he had last year, as follows:

Frank Clifton,
Charley Conley,
Stan Krentel,
Red Newton,
Cleve Nixon,
Dick Saltonstall, and
Fred Wagner.

The program will follow much the same course as last year. There will be the usual stag dinner; many door prizes; golf; soft ball games; bait casting, and horseshoes. Extra attractions will be an egg throwing contest, a trick putting contest, and a pie eating contest. A checker tournament, to be played on a 10-foot square checker board is also planned.

Tickets, available from Frank Clifton, 16536 Inverness, Detroit 21, are $5.00 and include everything except the golf fees.



New • EQUIPMENT • MATERIALS • PROCESSES

Porsalaka

A recent development in synthetic enamel formulations has been introduced by the Lacquer and Chemical Corp., 214 40th St., Brooklyn 32, N. Y., under the trade name "Porsalaka." The material was developed for use on metals to replace the hot firing or porcelainizing operation. Porsalaka may be applied by spray, dip, or roller coating, and when baked for 15 minutes at 300 deg. F. provides a hard, high gloss, mar-resistant finish. It is available in white, black, and all colors, and is ideal for use on fluorescent fixtures, refrigerators, washing machines, and kitchen cabinets, the manufacturer claims.

Circo C-120 Degreaser

The design of a large capacity Circo vapor-spray degreaser has been announced by Circo Products Co., 6531 Euclid Ave., Cleveland 3, Ohio. This model, called the C-120, was designed for heavy industrial use. It has a vapor depth of 84 inches, inside length of 96 inches, and width of 60 inches.

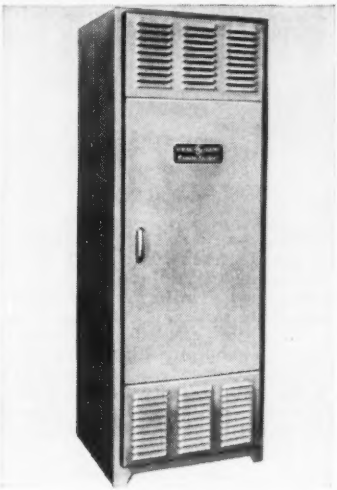
The Circo C-120 Degreaser is available in either nickel clad, stainless clad, or zinc sprayed construction. Its non-flammable, non-explosive solvent is heated by steam, gas or electricity, forming a blanket of vapor which is 84 inches deep. Ample heat input assures a cleaning capacity of 18,000 pounds per hour. An outside water jacket and inside water coils give double protection against vapor loss.

According to the company, Circo-Solv, the solvent used, is absolutely harmless to all metal. Depending on size, parts degreased by the Circo vapor and spray method can be removed absolutely clean and dry in 1 to 15 minutes, it is claimed.

Circo C-120 Degreaser

G.E. Oil-Immersed Selenium Rectifier

An oil-immersed selenium rectifier especially designed for electroplating, and particularly barrel plating, has been announced by the General Electric Company's Lighting and Rectifier Divisions. Believed to be the first standard rectifiier using hermetically sealed selenium stacks to withstand the corrosive atmosphere of a plating room, the unit is available in two models: 6/12 volts, 1500/750 amps., 230/460 volts a.c., 60 cycles three phase; and 9/18 volts, 1500/750 amps., 230/460 volts a.c., 60 cycles, three phase.



G. E. Oil-Immersed Selenium Rectifier

The G. E. Rectifier consists of a transformer, fan, and twelve rectifier stacks arranged in a steel casing. Each stack, hermetically sealed in an oil-filled can, contains matched selenium cells connected in parallel through heavy internal bus bars to mechanically sealed terminals, utilizing Neoprene for sealing and glazed porcelain for insulation.

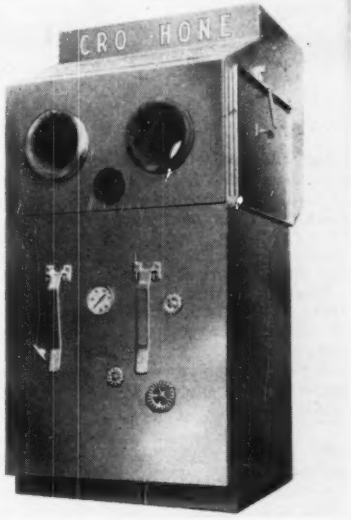
The fan mounted in the top of the unit blows air downward so that it passes first over the rectifiers and then over the transformer, thereby giving the rectifiers benefit of the coolest air. Each unit consists essentially of two rectifiers with individual bus bars brought out at the rear, which may be connected in series or parallel to give full current at normal voltage of half current at double voltage.

The transformer is arranged so that the primary may be connected for 230- or 460-volt circuits. Taps are provided to compensate for line voltage variations.

Cro-Hone Wet Blaster

Designed to utilize fine abrasives suspended in water as a blasting medium to clean and finish metal surfaces, the Cro-Hone Wet Blaster has been developed by The Cro-Plate Co., Inc., 3343-47 Main St., Hartford 5, Connecticut.

A number of design features are listed by the manufacturer. These include: use of stainless steel or metal parts which came in contact with the liquid slurry or stainless steel or brass; use of siphon jet guns and properly engineered air agitators; splashproof work loading doors (side opening) which make possible the handling of large parts in the standard 20 x 30-inch cabinet. All valves and controls are located at the front of the cabinet for easy operation. The wide angle of the viewing windows makes possible comfortable operation of the Cro-Hone by tall or short operators. The 600 c.f.m blower assures clear vision by removing the abrasive vapors at the work level. Adequate lighting is assured by two-position il-



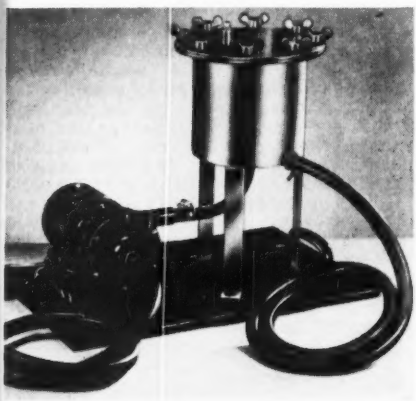
Cro-Hone Wet Blaster

lumination, and a drawer-type filter makes possible quick and easy machine cleaning.

A few of the industrial uses for which the Cro-Hone may be utilized are initial die and mold polishing; heat treat stain and scale removal; deburring; removal of grinding or tool marks; surface preparation prior to electroplating; and surface preparation for painting.

Lang Filter Model SS6

Manufactured by the Lang Filter Co., 52 W. 46th St., New York 19, N. Y., the Lang Model SS6 is an all stainless steel



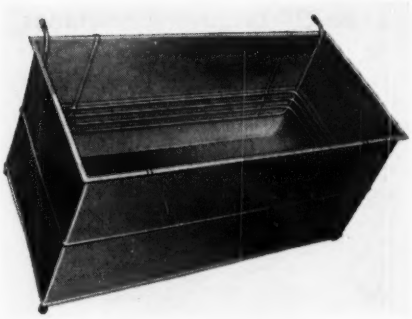
Lang Filter Model SS6

filter, welded with stainless steel rod for a perfect seal. It processes four gallons of liquid per minute at zero pressure and delivers a fine degree of filtration. Powered by an a.c. motor, 110 volts, 60-cycle, single phase, the unit is portable, weighing only 24 pounds.

The filter medium is a diatomaceous earth, thus eliminating bags, tubes, pads or paper. Cleaning is accomplished by simply attaching the filter hose to an ordinary sink faucet. The removable top permits easy access to the filter in case of clogging.

Anodizing Tank

A tank for anodizing aluminum, primarily constructed to give continuous service for three years under normal



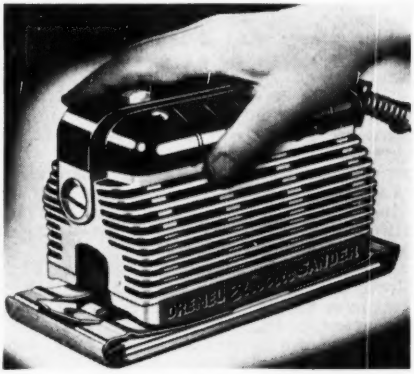
Anodizing Tank

operations, has been announced by the F. H. Langsenkamp Co., 227 E. South St., Indianapolis, Indiana.

Designed especially for the anodizing process, the tank is reinforced within itself (the welds at all four corners overlapping), to keep buckling at a minimum, prevent galvanic action, and lengthen the life of the tank. It is available in all sizes, in stainless steel, aluminum, or copper. A lead lining is also obtainable.

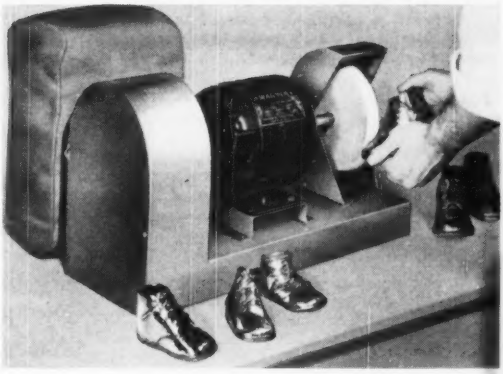
Dremel Model 2000 Electric Sander-Polisher

Speed, ease, and versatility in sanding, rubbing down or polishing, even in tight corners or other awkward spots, are featured advantages of the Model 2000 Elec-



Dremel Model 2000 Electric Sander-Polisher

"No-Dust" Electric Buffer and Polisher



tric Sander and Polisher introduced by the Dremel Mfg. Co., Racine, Wisconsin.

The Model 2000 uses the same engineering principle as the lighter Model A Dremel sander-polisher, and it can be used on flat, curved, or rounded surfaces and on metal as well as wood.

Although the tool weighs only five pounds, it is ruggedly constructed to withstand continuous shop use. It is shaped to fit the hand easily. Straight line reciprocating action produces a smooth surface, free from scratches, burns or machine marks. It delivers 14,400 strokes per minute, each stroke approximately $\frac{1}{16}$-inch long. Total sanding surface is 21 square inches.

Instant control is provided through a pressure-type hand switch on the Bakelite cover of the die-cast aluminum housing. The model is not affected by dust or dirt, and there are no wearing parts to require oiling. It operates from any 110-120 volt, 60-cycle, a.c. outlet through an 8-foot, three-wire Underwriter's approved cord. Abrasive paper is held by a cam-type clamp. Changing can be accomplished in seconds.

"No-Dust" Electric Buffer and Polisher

Warner Electric Co., 1512 W. Jarvis Ave., Chicago 26, Ill., has announced a bench-size buffing and polishing unit designed especially for electroplaters, jewelers, service and repair shops, laboratory and machine shops.

One of its outstanding features is the built-in vacumatic dust collector system that completely eliminates nuisance dusts when using scratch brush, abrasive wheels or cloth, or felt buffs. A high velocity, mill-wheel type exhaust fan instantly removes wheel ravelings, grit, and dust from work area and disposes of them in the air-filter collecting bag; no external exhaust is required.

The complete unit is 20 by 8½ by 11½ inches in size for easy portability. The buffing shield is designed to accommodate any type wheel up to 8 inches in diameter, and requires only a minimum of maintenance, the mill-wheel type fan blades being self-cleaning.

Specifications of the unit include a 110-120 volt 60 cycle a.c. split-phase motor, direct drive to wheel arbor and exhaust fan; on-off switch and heavy duty rubber-covered cord and plug; blower housing, base and buffing shield of heavy gauge sheet steel with attractive metallic green Hammertone finish.

Ahcoloid 59-S Cleaner

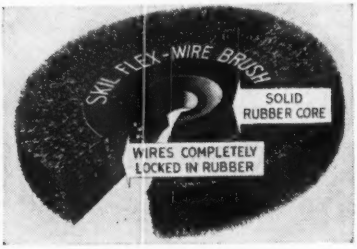
Ahcoloid 59-S Cleaner, a scientifically-balanced cleaner for electrolytic cleaning of brass, which may be used with either cathodic or anodic current, has been announced by the Apothecaries Hall Co., Waterbury 88, Connecticut.

According to the company, special wetting agents assure exceptional penetrating action. An ordinary water rinse washes away the film in little time. Ahcoloid 59-S Cleaner is also recommended as a medium-duty cleaner for steel, as a soak cleaner for lightly-soiled brass or steel parts, or as a tumbling cleaner.

"Skil" Flex-Wire Brush

A wire brush designed for various power brushing operations, such as removing scale, rust, carbon paint, weld spatter, and surface imperfections from castings, metal parts, and fittings, has been announced by Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill. The wires of the brush are set in a solid rubber core which is said to reduce the danger of flying bristles and permit the use of the brush down to the core. The rubber holds

each wire securely, yet allows the wire to "give" without bending. Individual wires are kept in an upright position, thus providing for a maximum amount of



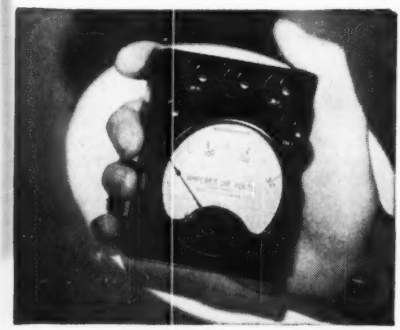
"Skil" Flex-Wire Brush

cutting points in contact with the work.

The "Skil" Flex-Wire Brush is available in 4, 6, 7, and 8-inch diameters.

Type P-12 Portable Instruments

A line of portable instruments, designated as Type P-12, is available from the Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa. Rated in the two-per cent accuracy class, the line utilizes both moving-iron and permanent-magnet



Type P-12 Instrument

moving-coil mechanisms in a compact molded case.

Included are single and multiple range models. Ammeters are available in full scale ranges from 20 microamperes to 50 amperes d.c., and from 5 milliamperes to 50 amperes a.c. For d.c. voltages, the full-scale ranges run from 10 millivolts to 800 volts, with a.c. ranges from 1.5 to 300 volts. Rectifier milliammeters are available in full scale ranges from 0.5 to 10 milliamperes, and rectifier voltmeters from 2 to 800 volts.

The complete line is magnetically shielded to permit use of the instruments on both magnetic and non-magnetic surfaces.

Sealbrite

Developed by the London Chemical Co., 607 S. Dearborn St., Chicago 5, Ill., for use by the metal cleaning, fabricating, and processing industries, Sealbrite acts as a rust inhibitor on black oxidized, phosphated, or untreated metal surfaces and affords maximum protection of metal surfaces during inter-operational and finished product storage.

Any water on the metallic surfaces, no matter how deeply creviced or irregular, is displaced by a protective film. Sealbrite covers 3,000 square feet of surface per gallon, it is stated.

According to the manufacturer, Sealbrite does not darken copper, brass, or bronze, or white metals. Applied by cold dip or spray, it forms a dry, waxy-feeling film which can be easily removed by petroleum naphthas, even after a year. The water removed from the surface drops to the bottom of the tank and can be drained off periodically without affecting the efficiency of the solution. Its fingerprint-neutralizing qualities eliminate the need for reprocessing and prevent rusting under the film.

Sargent Model III Polarograph

E. H. Sargent & Co., 4647 W. Foster Ave., Chicago 30, Ill., announces its Manually-Operated Polarograph.

While it may be used in any phase of polarography, it is particularly recommended for the following applications: (1) In routine analyses where only one substance is determined and where the step shape approximates a pure form, charateristic of reversible reactions involving simple ions in fairly substantial concentrations. In such cases, step height may be measured as the difference between two points, one on the residual current plateau and one on the diffusion current plateau. For measurements of this type the Model III is preferable to a recording Polarograph because of the speed and ease with which it may be operated even by relatively non-technical

Sargent Model III Polarograph

personnel. (2) In the performance of amperometric titrations; and (3) For instructional purposes in educational institutions where the 315 mm. long, readily-visible scale and the simplicity of design make the unit ideal for demonstrations and illustration of the basic circuit employed.

Alkon Electrolytic Cleaner

After extensive laboratory research and successful field testing under actual plant operating conditions, the DuBois Co., Cincinnati 3, Ohio, is marketing its electrolytic cleaner, Alkon.

Because of its versatility, Alkon is suitable for either direct or reverse current cleaning of both ferrous and cuprous metals. According to DuBois, it combines all the attributes of a hot tank cleaner, wetting, emulsificaion, soil suspension, hard water control, with the necessary electrical properties. One of its features is foam control to eliminate solution spattering and minor explosions.

Sprayit Series 270

A ¼ h.p. diaphragm compressor paint sprayer has been marketed by The Electric Sprayit Co., Sheboygan, Wis. Known as the Sprayit Series 270, it delivers oil-free air, and is self-lubricated for trouble-free lifetime service.

Compact and portable, its 5-inch replaceable diaphragm assures quiet vibrationless operation. It is equipped with a safety valve, and will deliver 1.7 c.f.m. clean air at 30 pounds pressure. Various models are available in this series.

Daniels Bench Tumbling Barrel

The Daniels Plating Barrel & Supply Co., 129 Oliver St., Newark 5, N. J., has announced the development of a Bench Tumbling Barrel which is designed for handling odd lots in finishing shops.

This machine may be operated as an oblique barrel or as a horizontal barrel, thus facilitating the handling of a great percentage of all types of work. The barrel may be used wet or dry; it also has great value as a sawdust drying machine. Cylinders are fabricated from hard maple, steel or Neoprene-lined steel.

The operation has been simplified by a belt drive from a ratio motor. The cylinder is motivated by friction rollers especially designed to be free from slippage and nearly noiseless in operation.

The adjustable angle brake holds the cylinder securely in the various positions as indicated above with a freely working release clutch for changing position, the manufacturer states.

Bench Tumbling Barrel

No. 7318 Clear Baking Finish

An anti-corrosive clear baking finish for brass and brass products has been developed by the finishes laboratories of Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, New York.

Named No. 7318 Clear Baking Finish, the coating is recommended for builders' hardware, cosmetic cases, lighting fixtures, marine fittings, luggage hardware, and so on.

GS No. 777 Chemical Pump

A special diaphragm, that stands up unusually well in most fluids, is the outstanding feature in the No. 777 Chemical Pump, now available from the General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa. It is especially made for pumping lacquer thinner, synthetic thinner, turpentine, acetone, benzene, benzol, perchlorethylene, trichlorethylene, detergent oils, linseed oils, stoddards solvent and other solvents.

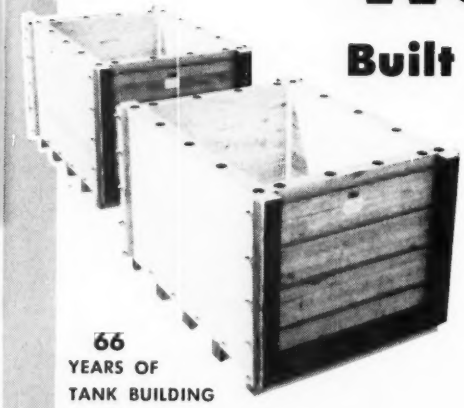
The special diaphragm is made of heavy cross weave cord, plastic coated on both sides. Its resistance to chemicals makes this pump ideal for many fluids.

GS No. 777 Chemical Pump

The pump is fitted with an automatic drain-back feature, brass valve seats and Bakelite valve disc, and is equipped with an adjustable suction pipe, to fit either ¾, 1½ or 2-inch openings.

WOOD TANKS

Built to Specifications



66 YEARS OF TANK BUILDING SERVICE

Plating and pickling tanks built to your specifications is a Kalamazoo specialty — any size or shape — fir, oak, cypress or redwood.

Tanks on left were made for large manufacturer of automobiles. They are 88" x 64" x 62" — made of 8" long-leaf yellow pine with B & M anti-acid metal tie rods.

Write today for estimates and suggestions.

Kalamazoo TANK AND SILO COMPANY

728 HARRISON ST. • KALAMAZOO, MICH.

MURRAY WAY #50 UNIVERSAL HEAD

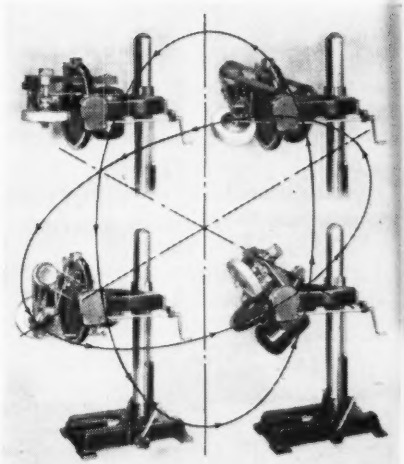
The extremely versatile polishing and buffing heads are first choice wherever finishing of flat or irregular shapes is required. The M-W #50 is only one of our standard-built, full-floating, pedestal-type heads for use in combination on continuous or indexing rotaries; or with straight-in-line or semi-automatic machines.

Our thoroughly experienced engineers will also design and build special automatic polishing or buffing equipment to your exact requirements.

MAJOR IMPROVEMENTS PIONEERED BY MURRAY-WAY

- ***Full-Floating Head.*** **Assures uniform working pressure.**
- ***Adjustable Fulcrum.*** **Permits compound angle adjustments.**
- ***Variable, Selective Dwell.*** **Two seconds to two minutes.**
- ***Automatic Belt Contour-Finishing.***
- ***Micro Polish Process*****—prepolishing before forming.**
- ***Ventilated Buffing Wheels.***

Your inquiries are invited.



360° Both Axes Simultaneously

MURRAY WAY

THE MURRAY-WAY CORPORATION

3925 WEST FORT STREET • DETROIT 16, MICHIGAN

AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

PRO-BRITE

Trade Mark Reg. U.S. Pat. Off.

HERE is new brilliance in coloring nickel, brass, copper and aluminum...new mileage...new speed...new cleanability — with a totally new development in lime buffing compositions.

Prozite is a unique natural abrasive which offers unlimited possibilities for increased performance and lower cost for the metal finisher.

New bases developed for use with this abrasive provide exceptional cleanability and excellent resistance to slaking.

PRO-BRITE lime finishes go farther, last longer, clean easier, cost less to use. Ask for details.

THE Prozite DIVISION

Gerity-Michigan Corporation
Adrian, Michigan

Murphy Type V-907 Aftercooler

For those who use small quantities of cool, dry, compressed air, Jas A. Murphy & Co., Inc., 5th and Vine Sts., Hamilton, Ohio, has made available a line of small, vertical aftercoolers.

Murphy Type V-907 Aftercooler

Designated as Murphy Type V-907 Aftercooler, the line comprises two sizes. The smaller size measures 30 inches overall, with legs as shown, and cools up to 20 c.f.f.a.p.m. The larger size measures 48 inches overall and cools 30 to 50 c.f.f.a.p.m. Air inlet and outlet pipe sizes up to 1 inch may be specified for either unit.

The Type V-907 is made of an outer steel shell of correct size for the required capacity, which encloses a tube nest through which the cooling water passes. Hot air entering the cooling chamber is guided slowly about these cooling tubes from the intake at the bottom left to the outlet at the top center. Separated moisture drops by gravity to the trap below the bottom head, from which it is ejected as collected. Water inlet is shown on the photograph at the lower right of the unit, and water outlet, with sight-drip connection, is shown at top right.

Plating and Polishing Shop "Widgets"

The word "widget" is not in the dictionary, but was coined to cover the endless variety of little, seemingly insignificant items that save time, eliminate trouble, and cut costs; in other words, the thousand-and-one everyday indispensables used in plating and polishing. They are almost unnoticed—until they are not there when needed.

A full line of these widgets is featured by the Hanson-Van Winkle-Munning Co., Matawan, N. J., which includes the fol-

PROVIDES 4 OUTSTANDING SAVINGS

1. More Prime Surface for More Efficient Heating.
2. Develops Quick Heat for Quick Starts. (As Much as 50% Faster Than Pipe Coil.)
3. Takes Half the Space, Weighs Half as Much as Pipe Coil.
4. Platecoils Are Easily Cleaned or Replaced in Minutes . . No Downtime . . No Tank Dumping.

Take advantage of the complete engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete technical manual and descriptive Bulletin No. P50

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

Why Platecoils Cost Less

LOW FIRST COST

The initial cost of Platecoil is often 50% or more below the cost of equivalent pipe coil depending, of course, on the materials used in construction.

EASY INSTALLATION

By the use of "quick change hangers" Platecoil installations can be made in open tanks in one-half hour or less by one man and a helper.

NO THREADED JOINTS IN TANK

The entire Platecoil is electric welded and pressure tested. There are no joints to corrode or leak. Both connections to the Platecoil can be located above the liquid level where there is no danger of thread corroding and freezing.

GREATER TANK CAPACITY

A 22" x 47" Platecoil gives the same heat transfer surface as 32 feet of 1½" pipe. This pipe requires a space approximately 30" x 60". Platecoil thus saves about 50% over equivalent pipe coil.

WEIGHS 50% LESS

Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle. A whole maintenance crew is not needed to transport and install Pipecoil.

TANK MAINTENANCE WITHOUT LOSS OF SOLUTION

There is no need for workmen to get inside the tank in order to make replacements or repairs. A Platecoil can be removed in a matter of minutes with the solution still in the tank.

LITERATURE

The new Platecoil Bulletin furnishes a complete description of the Platecoil method of tank heating. Write for your copy today.

HIGH BTU TRANSFER

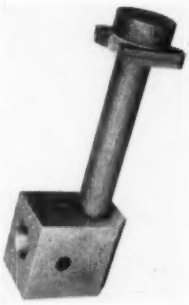
More prime surface of Platecoil can be installed in a given area than can be obtained with pipe coil. Thus a more compact Platecoil unit provides much greater BTU transfer per unit area than can be obtained with pipe coil. Quick starts in heating tank solutions mean more hours of productive time.

Kold-Hold Manufacturing Company, Lansing 4, Michigan

lowing: air agitation piping; Koroseal aprons, which are light and tough; brushes of all kinds: circular cotton wick, cotton, potash, end, goblet, glue, hand, satin finish with S hook, sawdust, scouring, spiral ring, Tampico and StapLbond, and watch case; Pur-O-Carb activated carbon; carboy pouring spout with safety air vent; steel, safety-type carboy tilters; Klinch grain cement and thinner; platers' clocks; comparator sets; earthenware crocks; earthenware dipping baskets; Turkish emery; emery troughs; Fulflo filters for air; Fotopor paper for detecting pores in nickel plate over iron or steel; Neox coated gloves; Belgrade glue; electric glue heaters; hydrometers; Jernstedt electroplating computer; Kote Masq stop-off lacquer; Kote-Rax liquid rack covering; leather for polishing; platers' microscopes; glazed earthenware pitchers for acid; rubber pails; pH slide compartor; Platin-Nig for oxidizing silver; pneumatic acid pumps; Kube-Cut hardwood sawdust for drying; scrap anode baskets; wooden soled shoes; solution skimmers; spray floats for chromium; insulating steam joints; syphon breakers; temperature controllers; wheel balancing ways; wheel trimmers; Wrap-Rax tape.

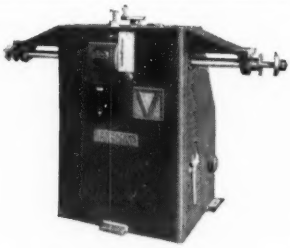
"Karbate" Circulating Steam Jet

The Series FM-1A "Karbate" Brand Impervious Graphite Circulating Steam Jet has been announced by National Carbon Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, New York.



"Karbate" Circulating Steam Jet

The jet is made entirely of Karbate impervious graphite, while the riser is a standard Karbate impervious graphite pipe fitted with a Neoprene "Flexlock" gasket at the submerged connection to the jet and a Type V flange connection at the other end, permitting simple connection to steam lines. This construction assures complete resistance to the corrosive action of the liquid being heated. It is avail-



PLENTY OF ELBOW ROOM!

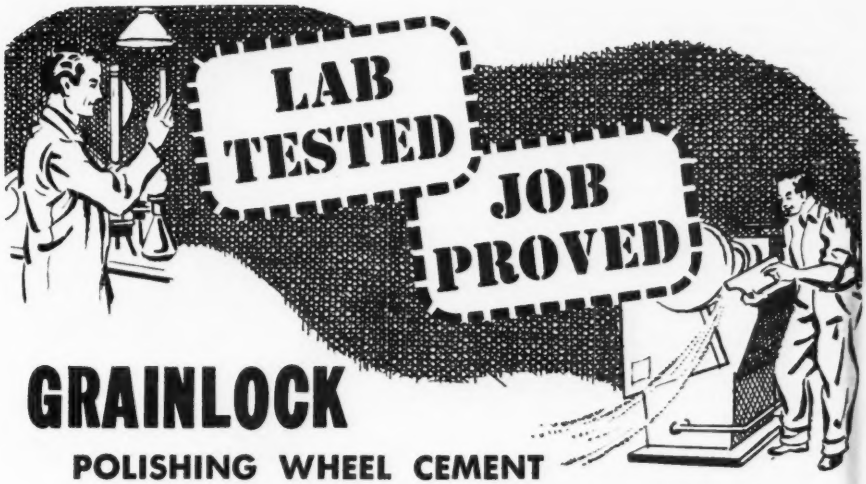
You'll see at a glance that the "underslung" design of this new Marschke machine provides more elbow room for buffing and polishing operations than was ever before possible. No interferences under the spindle between the wheels and side walls of the base. Ideal where greater freedom of action in work with bulky pieces is desired. Unusual spindle rigidity. Maximum dependability of accurate bearing alignment. Many unique features.

Made with one and two spindles in various sizes with motors ranging from 1 HP to 30 HP.

VONNEGUT MOULDER CORPORATION

1810 MADISON AVENUE • INDIANAPOLIS 25, INDIANA

This new buffing spindle—or one of the dozens of other Marschke machines—may be the answer to *your* production problem. Tell us about it, we'll try to help.



GRAINLOCK

POLISHING WHEEL CEMENT

for every metal polishing need

You can prove the superiority of GRAINLOCK polishing wheel cement in your own plant. You get immediate proof in longer polishing wheel life and greater polishing wheel production.

There's no guess-work with GRAINLOCK. A specific cement is available for every polishing wheel and belt need, from roughing to finish. With GRAINLOCK cement polishing wheels last longer between set-ups—give better results on all metal polishing jobs.

Why be satisfied with ordinary cement or glue? GRAINLOCK costs no more, yet gives you cement designed for your particular job.

SEND FOR FREE BROCHURE . . .

Containing dozens of time and money saving tips on setting up polishing wheels for longer life and maximum efficiency.

INDUSTRIAL LUBRICANTS COMPANY Incorporated

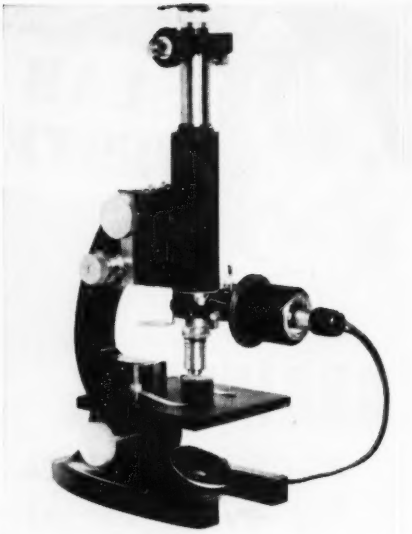
14459 WILDEMERE, DETROIT 6, MICHIGAN

able in two sizes, Size 2 and Size 4, with riser assemblies up to 9 feet 3¾ inches in height, and supplements the two types of Karbate impervious graphite heat exchangers which are used for indirect heating of open tanks.

The circulating steam jet is particularly adapted to the heating of liquids in tanks where agitation and good circulation are requisites and where dilution of the solution is not harmful. According to the manufacturer, it will withstand the action of practically all corrosive liquids, including sulfuric acid, hydrochloric acid, and nitric-hydrofluoric acid mixtures, and is recommended for heating acid solutions, and for many other operations performed by injection of steam. It can be subjected to severe thermal shock without cracking, chipping or spalling.

Electroplater's Microscope

An important plater's "widget" supplied by the Hanson-Van Winkle-Munning Co., Matawan, N. J., is the Model CM Electroplater's Microscope for measuring the thickness of electroplate. The use of this microscope results in better and more accurate control of plating, fewer rejects, and a great reduction in the operations of stripping and replating, it is claimed.



Electroplater's Microscope

Both coarse and fine focusing adjustments are provided. The microscope stage is 115 x 130 mm. and can be fitted with attachable graduated mechanical stage. The mechanical stage has a range of movement to permit complete examination of areas 65 x 79 mm. A long spring-actuated finger holds the specimen holder. The mechanical stage is held in position by two screw clamps and can be replaced in register.

The microscope is also equipped with special features for metallography, such as a vertical illuminator. It may also use an attachable illuminating unit, or an independent light source of greater intensity for photomicrography and work with polarized light.

ODDS ARE 2 TO 1

You'll get a cleaner surface with the improved DETROIT HANDY "TAC" RAG. Standard of your FINISHING INDUSTRY for 16 years. Removes all particles of dust, lint and sand. Non-inflammable! Order from your supplier today, or send for sample.

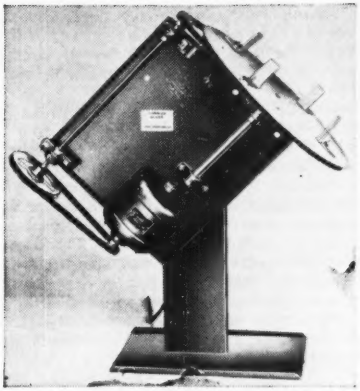
DETROIT HANDY "TAC" RAG

DETRO MFG. & SALES CO., INC., CULVER CITY, CALIF.

Portable Tumbler-Mixer

A portable universal Tumbler-Mixer that will tumble or mix anything has been marketed by the Rampe Manufacturing Co., 3029 Prospect Ave., Cleveland 15, Ohio.

Quickly movable from one job to another, it tilts through a full 90-degree arc



Portable Tumbler-Mixer

so that the work can be tumbled at the best angle.

The Tumbler-Mixer is adapted to many uses due to the adjustable turntable clamps that allow standard and odd shaped containers to be used. Regular octagonal tumbling barrels of steel or non-metallic materials are furnished as extra equipment.

Ideal for small lots in large or small shops, experimental departments, laboratories, chemical plants, and so on, the unit can also be used to mix paints and add colors to plastic granules.

Corrosion Inhibitant Wax Coating

A coating that provides unusual protection against rust and corrosion for metal surfaces has been developed by S. C. Johnson & Son, Inc., Racine, Wis. This wax gives aluminum, steel, brass, and other ferrous and non-ferrous metals a dry coating that is resistant to salt spray, high humidity, and outdoor exposure.

The wax dries tack-free in less than ten minutes after application, and has a coverage of 2,000 to 2,500 square feet per gallon.

It is easy to apply by the conventional

NEW and better

BFC LACQUER THINNER

with these extra values at no extra cost

Better Solvent Strength—You can use higher-solids

Better Flow Out—Less Orange Peel—Less Blushing

Better Gloss in Your Coatings.

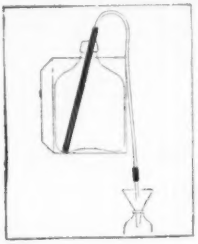
Chances are that BFC LACQUER THINNER costs no more—possibly less—than you now pay. You have everything to gain—nothing to lose—by getting our price and special Test-Sample Offer. Write today.

Better Finishes and Coatings, Inc.

268 Doremus Avenue, Newark 5, N. J.

122 East 7th St., Los Angeles 14, Calif.

Speare's Safety Siphon



Efficient, safe removal of acids from carboys and drums

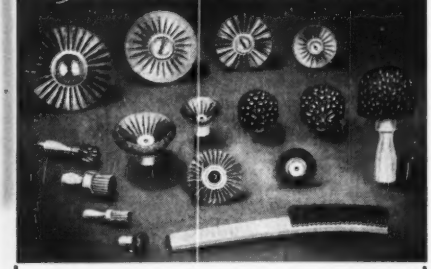
Easily and quickly primed by built in pump. Scientifically designed. Does away with dangerous juggling of containers. Made of inert plastic. Saves time! Prevents accidents!

Write for Information!

THE ALDEN SPEARE'S SONS CO.

137 Sixth St. Cambridge 42, Mass.
TRowbridge 6-0533

DIXRIP
fine wire
SCRATCH BRUSHES



FOR SILVERSMITHS, PLATERS, JEWELRY MFGRS., ETC.

Supplied in brass, steel or nickel silver wire in sizes .0025 - .006 or bristle, Nylon or fibre.

Special sizes and shapes to order.
Write us (dep't. P) for catalog and price list.

DIXON & RIPPEL, INC. KINGSTON, N. Y.
ESTABLISHED 1856

dip, brush, wipe or spray methods, and when dry leaves a transparent film on the metal. The wax is not removed through handling or contact with packing materials.

The wax can be used on any metals to which shellacs or varnishes are now applied. The wax is not gummy, sticky, or greasy as are oil base coatings. If for any reason it becomes necessary to remove the wax, it is easily wiped off with ordinary solvents, including mineral spirits.

The protective wax coating need not be removed before painting over metal surfaces. Paint can be applied directly onto the wax with no appreciable difference in drying time or adhesion, it is claimed.

PRODUCT LITERATURE

The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

"Peroline," a rust preventing and metal treating oil, is the subject of **Technical Service Data Sheet No. 11-5-3** available from the American Chemical Paint Co., Ambler, Pennsylvania.

Platers' Cleaner. An electrolytic cleaner compounded especially for use on steel, brass, nickel, and die castings, Detrex 53 is described and illustrated in a folder being distributed by Detrex Corp., Box 501, Detroit 32, Michigan.

"An Introducton to Electrolytic Cleaning" is the title of an informative booklet being offered by The DuBois Co., Industrial Div., Cincinnati 3, Ohio. The booklet contains general information on electrolytic cleaning processes, and explains simply the phenomena taking place during both direct and reverse current cleaning and the advantages of each process. Also included are properties to consider in the choice of an electrolytic cleaning compound. A few typical cycles are given and also general recommendations for using Alkon Electrolytic Cleaner.

ACP Reference List A quick reference list of metal protective and paint bonding chemicals and processes can be obtained from the American Chemical Paint Co., Ambler, Pa. The purpose, characteristics, advantages, and effectiveness of ACP chemicals and processes are given in **Technical Service Data Sheet No. P-100-21.**

Paint bonding phosphate coating chemicals to be applied by either spray, dip, or brush are discussed in detail and numerous examples are given showing the correct application of these products to steel, iron, zinc, and aluminum. Applicable government specifications for these and other ACP products are included in the technical service data sheet.

"Permanite Resin Cement" is the title of **Bulletin No. 4J,** offered by the Maurice A. Knight Co., Kelly Ave., Akron 9, Ohio, which describes the corrosion resistant cement and its many uses. Application instructions, including directions for surface preparation, mortar preparation, and setting time, together with tables of physical and chemical properties, are included in the bulletin.

Lang "SS6" Stainless Steel Filter, its specifications and features, are described and illustrated in a bulletin released by Lang Filter Co., 52 W. 46th St., New York 19, New York.

"6000 Plants Cut Costs with Infra-Red" is the title of a 20-page brochure presenting in detail advantages to be gained through the use of Fostoria "Evenray" Heating Equipment. The infra-red ovens manufactured by The Fostoria Pressed Steel Corp., Fostoria, Ohio, are described in detail, feature by feature, and characteristics of the equipment are outlined. The products can be applied to baking, drying, dehydrating, preheating, degreasing, and other industrial operations. Installation views showing infra-red equipment in use in a number of plants are included in the booklet, together with a partial list of some of the many products being processed with the aid of Evenray ovens. A partial list of users in various states is also included.

Eastern Positive Pressure Pumps. Data, diagrams, and engineering sugges-

Write for Catalog of

PAINT TESTING APPARATUS

GARDNER LABORATORY

Bethesda 14, Md.

CORROSION-PROOF PROCESSING TANKS

- Corrosion-proof construction of processing and storage tanks; industrial flooring.
- Experience serving major steel, chemical, textile and food plants.
- Complete Facilities: Design; Engineering; Material; Construction; Maintenance.

Write for bulletin giving complete details

CHEMSTEEL CONSTRUCTION COMPANY, INC.

301 Chemsteel Building, Walnut Street, Pittsburgh 22, Pa.

YOUNG BROTHERS OVENS

for baking and drying

Designed and built to produce the finest results in baking processes such as PAINT FINISHING, METAL DECORATING, INSULATION BAKING. Batch or Conveyor Types for any fuel. Write for Bulletin 5.

YOUNG BROTHERS CO.

1837 Columbus Rd. *Estab. 1896* Cleveland 13, O.

tions about Eastern Positive Pressure Valve and Gear Pumps are contained in **Bulletin 200,** prepared by Eastern Industries, Inc., New Haven, Connecticut.

Rubber-lined Tanks. Tables showing acids which can be safely and economically handled by rubber linings and which give storage tank dimensions ranging from those which hold 225 gallons to 30,000 gallons are features of the new six-page catalog section on rubber linings and rubber-lined tanks just published by The B. F. Goodrich Company, Akron, Ohio.

The publication describes and pictures the B. F. Goodrich process for locking rubber to metal, discusses the materials used in various types of standard linings. Data on the comparative costs of acid storage in rubber-lined equipment versus the carboy are included.

Trolley Cable Conveyor. Specifications of standard stock units of "Universal" Trolley Cable Conveyor are given in **Bulletin No. 41,** announced by The E. W. Buschman Co., Cincinnati 32, Ohio. Shown are action photos illustrating applications in industry; automatic loading and unloading are also shown. In addition, the bulletin gives condensed data on trolleys, track, idler turns, vertical "S" curves, drives and quick vertical dips.

PAINT MIXER

MIRACLE
5 GALLON
PAINT REJUVENATOR
All paint restored to original consistency without opening the can.
2 minutes per gallon.
MIRACLE PAINT REJUVENATOR CO.
128 E. 10th St., St. Paul 1

"Spray-Painting with Electric Steam" is the title of **Bulletin 51** released by Livingstone Engineering Co., Worcester 5, Mass., which describes the company's line of packaged boilers for steam-spray painting.

Steam Hook-Ups. Sarco Co., Inc., Empire State Bldg., New York 1, N. Y., has published the sixth enlarged edition on Steam Hook-Ups, for steam traps, air vents, and industrial temperature controls, with additional valuable technical information. Copies are available free to maintenance engineers writing on company letterhead.

Technical Bulletin T-6 has been issued by The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., on the resistance of nickel and its alloys to corrosion by caustic alkalies. Twenty-four pages in size, it contains over 20 illustrations and 40 tables. Methods of testing as well as results are given, and nickel alloy irons together with the higher non-ferrous nickel alloys and pure nickel are discussed.

"Heiline News," Vol. 2, No. 2. A 20th anniversary issue of the publication, "Heiline News," is being distributed by the Heil Process Equipment Co., 12909 Elmwood Ave., Cleveland 11, Ohio. The publication presents a brief history of the establishment and growth of the company, describing the many services which the organization is capable of offering in the process equipment field. Photographs of officers and key executives of the company, as well as plant photographs, are used to illustrate the issue. Also included is a brief description of the company's products and services, including tank linings, lined pipe and fittings, impervious graphite heating units, lead products, tanks and vats, and acid and alkali-proof materials.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Repairing and Lining Wood and Steel Storage and Process Tanks for handling corrosives is the subject of **Bulletins C-6A** and **C-7**, issued by the Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo. Complete instructions for application of Carbo-Kote or Carbo-Flex in old or new equipment are given.

Cradle-Mounted Centrifugal Pumps. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., has published a four-page bulletin describing its new line of cradle-mounted centrifugal pumps for process and refinery service. The bulletin shows a sectional view of the pump with all of its features pointed out and described. In addition, the various types of drives are illustrated.

"Karbate" Circulating Steam Jet. A copy of **Catalog Section M-9101** which completely describes the steam jet and provides design, installation, and operation details may be obtained from the National Carbon Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, New York.

Steelfin Heavy Duty Heat Surface. The New York Blower Co., 3166 S. Shields Ave., Chicago 16, Ill., has available **Bulleton 492** describing its welded steel Heat Surface to meet industrial requirements for continuous heating service at steam pressures up to 150 pounds or more. Complete specifications are provided, together with photographs, tables and graphs.

Heavy-Duty Cleaning Compound. A heavy-duty, alkaline cleaning compound that has been developed for the cleaning of steel prior to vitreous enameling, Detrex 70, is described in a folder that has been released by Detrex Corp., Box 501, Detroit 32, Michigan.

Magnesium Finishes. A five-page bulletin, No. **DM113a**, describes the Dow No. 15 bright pickle for magnesium, which treatment can also be used as a decorative finish or cleaner. The bulletin, prepared by the Magnesium Div., Dow Chemical Co., Midland, Mich., discusses the solutions, materials, and procedures used in applying the treatment.

For Solution Clarification
Use an
INDUSTRIAL
FILTER

The flow rate of an INDUSTRIAL filter is based on the actual solution involved. You know the capacity you get. Furthermore, the labor, down time, and the inconveniences of cleaning, replacing the filter media, and reassembling the filter for every filtering cycle — all are eliminated by the Industrial Air-Wash Cleaning Method available for all models. It is necessary to remove the cover only when new filter cloths are installed. With Industrial filters, a clarified solution is always assured.

The engineering, design, and construction of Industrial Filters have proved out in long service and low maintenance costs. Industrial has the experience and is large enough to handle your filter requirements. Since 1927 filters and filtration systems have been an important part of our business.

Write for full information

INDUSTRIAL FILTER & PUMP MFG. CO.

1625 West Carroll Ave., Chicago 12, Illinois

Isocyanate-Based Adhesives. A comprehensive review of the development and present practice, both German and American, of isocyanate-based adhesives is contained in **Technical Bulletin No. P-145** available from Monsanto Chemical Co., Phosphate Division, St. Louis 4, Missouri.

In addition to offering an explanation of the mechanism of the adhesion attributable to the diisocyanates, the 14-page bulletin contains chemical and physical properties of two diisocyanates available. Examples of German and American practice, including formulations for bonding various combinations of materials, are also detailed.

Shriver Plate and Frame Filter Presses. T. Shriver & Co., 810 Hamilton St., Harrison, N. J., has published a two-color, eight-page bulletin describing and illustrating its line of filters. **Bulletin No. 108** instructs how to filter, how to select a filter press, and provides data on construction features and operation of its filter presses and diaphragm pump.

Fansteel Selenium Rectifiers. Fansteel Metallurgical Corp., Rectifier Div., North Chicago, Ill., is offering its **Bulletin RDP-112** containing engineering information, diagrams, and tables of its lines of selenium rectifiers.

"Polishing and Buffing with Power-Operated Brushes" is the title of a 16-page brochure, **L-267,** published by the Osborn Mfg. Co., Cleveland 14, Ohio. The complete technique of brush finishing by manual and automatic equipment is described and illustrated, and cost comparisons are made.

Tumb-L-Matic Process. Lupomatic Industries, Inc., 4510 Bullard Ave., New York 66, N. Y., has issued the following bulletins:

Bulletin No. XL-50 describes Type XL wet-process tumbling barrel, which can be used for deburring and cutting down forgings, stampings, castings, and for wet washing of plastics. **Bulletin No. MU-50** covers Tumb-L-Matic's F and S multiple unit tumbling barrels for either wet or dry process. Both types of multiple unit barrels are used for heavy production deburring and for cutting down and finishing metal parts.

General recommendations of the Tumb-L-Matic Compounds that will give best results for each type of barrel are offered in each bulletin.

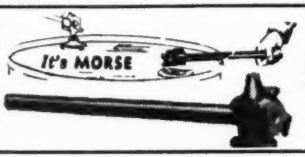
Brush Electroplating Catalog. Equipment and supplies needed for operation of electroplating by the brush method are listed and described in **Bulletin 148** distributed by the Ajax-Consolidated Co., 4615 W. 20th St., Chicago 50, Illinois.

Equipment supplied by the company for brush electroplating of ferrous and non-ferrous metals includes: a rectifier or power unit which may be plugged into any 110/120-volt, 60 cycle, alternating current power source; cleaning compounds, plating brushes, anodes, and various plating solutions. Equipment is available for the plating of brass, bronze, cadmium, copper, gold, lead, nickel, black nickel, silver, tin, and zinc by this process.

The bulletin further points out the advantages of the Brush Electroplating Process in that articles and equipment may be plated "in place" or "as installed" without being dismantled. The bulletin contains descriptions of materials and methods required for this process, as well as price lists for all the equipment supplied by the company.

GOLD PLATING SOLUTIONS
In All Colors
Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant
Proven Quality by the Acid Test
Write or call our experts about your plating problems
Davis-K-Products Co.
54 West 22nd St., New York 10, N. Y.
Oregon 5-0094
5-0095

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED... **$2.60**
Non-sparking type $4.00
Plus Parcel Post
MORSE MFG. CO., Inc.
124 Dickerson, Syracuse 2, N.Y.

Polyclad. New Product Data Sheet C-11, prepared by the Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo., describes Polyclad, a flexible, non-toxic, non-flammable, tough and thermoplastic polyvinyl chloride coating system which, when properly applied, is waterproof, unaffected by weather, inert to most corrosive atmospheres, dilute acid and alkali solutions, and gasoline and oil.

Gray Finishes for Industrial Apparatus and Equipment (Z55.1-1950). Published by the American Standards Association, 70 E. 45th St., New York 17, N. Y. Price, 35 cents.

The standard defines the scope of the recommendations, methods of color identification and measurement, and lists the four standard grays in addition to secondary standards, tolerances, and gloss specifications. Informative data regarding the Munsell system of color notation are included.

Color chips of the standard grays are available from ASA for use as masters for inspection by a visual comparison method appended to the standard.

"How to Strip Paint" is the title of an interesting account of materials and procedures, designed to simplify the removal of oil base and synthetic paints, enamels, and similar finishes from metal surfaces. The illustrated, 14-page booklet, published by Oakite Products, Inc., 120 Thames St., New York 6, N. Y., discusses specific paint-stripping materials and describes four simplified methods of removing paint from surfaces. These are: (1) the hot flow-on method, where surfaces are flooded with hot solutions of stripping compound to remove paint from large areas or parts too big for immersion stripping; (2) the cold-spray method, where pressurized cold solutions are employed to strip paint from large parts when equipment or facilities are limited; (3) the steam gun method, where paint is blasted off surfaces by the rapid, combined action of steam and stripping compound; and (4) the tank immersion method, for effective stripping of rejected parts in mass production operations to prepare them for resurfacing.

Also discussed briefly in the booklet are specialized materials for surface preparation of parts before repainting to promote improved paint adhesion, and materials for efficient anti-rust protection of stripped rejects awaiting repainting.

Cro-Hone Wet Blaster, designed to utilize fine abrasives suspended in water as a blasting medium to clean and finish metal surfaces, is fully described and illustrated in a four-page bulletin issued by The Cro-Plate Co., Inc., 3343-47 Main St., Hartford 5, Connecticut.

Homogeneous Lead Anodes for Chrome Plating, their characteristics and specifications, are the subject of a two-color four-page illustrated bulletin released by the Republic Lead Equipment Co., 7930 Jones Rd., Cleveland 5, Ohio.

Hydrion Canister Demineralizers, both battery water and laboratory types, for use in small scale electroplating operations and for spot location work, are illustrated and described in a pocket-size folder issued by A. E. Tomkin & Co., 1828 Columbia Rd., N.W., Washington 9, D. C.

Complete details covering its **No. 7318 Clear Baking Finish** for brass and brass products are contained in a comprehensive technical bulletin obtainable from the Industrial Sales Dept., Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, New York.

FASTER, BETTER FINISHING
with
HARRISON'S
NEW

BUFFING *and* POLISHING COMPOUNDS

You send us a sample of metal used. We will return finished sample together with compound for your specific requirements.

Speed up production with correct compositions.

HARRISON & COMPANY, INC.
Haverhill, Massachusetts

"Physical Chemical Research in the Protective Coating Industry," presented as the first Matiello Lecture by Dr. Roy H. Kienle, Director of Application Research, American Cyanamid Co., Calco Chemical Div., Bound Brook, N. J., has been reprinted as **Calco Technical Bulletin No. 901.**

Chemical Resistant Coatings, a four-page folder available from The Wilbur & Williams Co., Greenleaf and Leon Sts., Boston 15, Mass., contains information on applications for maximum chemical, moisture, and rust resistance in varied industries for all metal surfaces.

Wheelco Chronotrols, automatic time-temperature program controllers, are the subject of **Bulletin CH-1** released by Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill. A schematic drawing of a typical time-temperature program, a listing of models, time cycle ranges, and prices are included.

"Permag for Aluminum Cleaning and Processing" is the title of a 12-page booklet offered by Magnuson Products Corp., 50 Court St., Brooklyn 2, N. Y. This data book on Permag cleaning and processing materials is carefully indexed to assist those dealing with fabrication and chemical preparation operations before maintenance of aluminum surfaces. New materials and new methods are included which cover all cleaning and the final finish.

Specifically covered are such items as hot tank immersion cleaning, metal washing machine cleaning, solvent cleaning, burnishing, frosting, stripping, cleaning before anodizing, and other operations.

Belke Porto-Platers. Bulletin 1120, available from the Belke Mfg. Co., Dept. PF, 947 N. Cicero Ave., Chicago 51, Ill., provides complete information on Belke Porto-Platers and other Belke small-lot barrels for barrel plating small odd lots in still plating tanks. Information on Belke Oblique Platers is also included.

Production 101 Centerless Feed, Abrasive Belt Polishing Machine is described and illustrated as to its features, operating characteristics and advantages in **Bulletin PF-5** obtainable from the Production Machine Co., Greenfield, Massachusetts.

Gardner Vertical Viscometer for rapidly measuring the viscosity of extremely viscous oils or similar products is the subject of a four-page leaflet distributed by Henry A. Gardner Laboratory, Inc., Bethesda 14, Md. Description, operation, maintenance, and features claimed for the unit are included.

"Latest Advances in Coatings Based on Bakelite and Vinylite Resins" is the title of a 16-page booklet prepared by the Bakelite Corp., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y. Improved materials and better techniques for application are featured.

Clarkstan Model 232 Microscope, for use in the laboratory, shop, or for production, is the subject of **Data Unit 186** prepared by the Clarkstan Corp., 11927 W. Pico Blvd., Los Angeles 34, Calif. Specifications and advantages are described, together with several illustrations.

McKeon's

"Liquid Sulphur"

"THE OXIDIZING AGENT OF TODAY"

For stripping copper and producing various oxidized finishes on copper and silver.

Economical. **Simple to use.**

Order 5 gal. on trial and approval

Sulphur Products Co., Inc.

GREENSBURG 8, PA.

SOLVENTS RECOVERED BY

THE LOFGREN PROCESS

We RECOVER YOUR

SOLVENTS and THINNERS

From - Wash Thinners, Spoiled Lacquers, Degreasing Machine Sludge, Etc.

Each customer's shipment, whether one drum or a carload, receives *proper and separate treatment.* Write to:

SOLVENTS RECOVERY SERVICE, INC.
101 Central Ave. or **Westfield, N. J.**

HAMMOND SOLVENTS RECOVERY SERVICE
241 Brunswick St. **Hammond, Ind.**

Opportunity Section

EXPERIENCED ESTIMATOR

Wanted by old established, large job plating shop for taking in and pricing job work, particularly silver plating. Position is permanent and offers excellent opportunity to right person. Located in Mid-Atlantic Coast City. Write Box No. 71, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

FOR SALE

METAL CLEANING EQUIPMENT—Complete 3 stage automatic cleaning machine, plus dryer, designed for use with motorized conveyor. Used about 4 yrs., in good condition. 3 cleaning units 10 ft. long, dryer 11 ft., tunnel opening 6' high x 20". Requires about 35 hp steam boiler. Also, double hand-spray booth, 46 ft. infra-red ovens. Steelcraft Mfg. Co., Rossmoyne, O. (in greater Cincinnati) SY 8800.

QUALITY PRODUCTS WANTED

TOP FLIGHT DISTRIBUTOR — Specializing in Buffing and Polishing Compositions and Supplies, wants distributorship of top quality products. Is in position to make financial investment in the right proposition. Write P.O. Box 47, Bloomfield, N. J.

Degreaser, Blakeslee, working dimensions 37" deep x 38" wide x 96" long—overall dimensions 46" wide x 82½" high x 105" long. Heated by low pressure steam, including hand spraying equipment, storage tank, etc. Inspection invited. $400.00. Box No. 72, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

Will BUY your dirty THINNERS and SOLVENTS. Send sample or letter giving approximate contents and solids. The Johann Company, 633 East 138th Street, Dolton, Illinois.

SALES ENGINEER

Situation open. Selling and assisting in development work of polishing wheel cements. Practical polishing experience and technical background essential. Former employee of standards department of company doing polishing would be desirable. Detroit location. Write all details to Box 75, c/o PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio.

EXCESS INVENTORY

14,000 gallons high grade lacquers, baking enamels, wrinkles and air dry paints, overruns and excess inventory, to be sold at a fraction of cost. Write for list.

THE KAY & ESS COMPANY

Kiser and Leo Streets **Dayton 4, Ohio**

POSITION WANTED

Finishing Superintendent, 45 years of age, with 22 years experience finishing refrigerators, washing machines, metal cabinets, and many small products. Familiar with all types of lacquers, synthetic enamels, specialty finishes and equipment. Best of references. Write Box No. 74, c/o PRODUCTS FINISHING, 431 Main St., Cincinnati 2, O.

FOR SALE

STEVENS FULL AUTOMATIC PLATING MACHINERY

1. 40 Station Rack Type Machine, Automatic Timing for Length of Plate and Bright Dip Set for Cadmium.
2. 40 Station Rack Type Machine, Automatic Timing for Length of Plate and Bright Dip Set for Zinc.
3. 29 Barrel Full Automatic Timing for Length of Plate and Bright Dip Set for Zinc.

CAN BE SEEN IN OPERATION NOW

Generating Equipment for machines also available.

Write Box 73, c/o

PRODUCTS FINISHING

431 Main St.

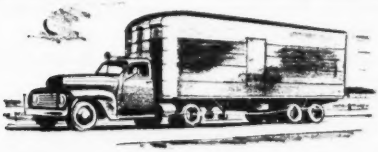
Cincinnati 2, Ohio

The Finishing Touch — **By J. A. Patterson**

"He got the idea from those fountain pens in banks!"

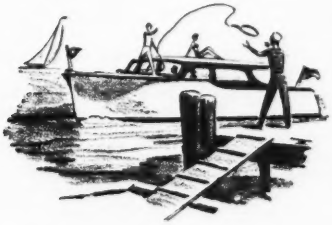
How Production-Wise Manufacturers

SAVE SANDING COSTS



ON LAND

The gleaming stainless steel that makes up these modern truck trailer bodies is polished with BONDITE* Jewelox paper belts. Because they cut faster, last longer, Jewel Abrasive Belts can roll up sanding savings for you!



ON THE SEA

Torn covers on drum sanders were causing costly slow-downs in finishing plywood sheets for this boat builder. AP Sales Engineer recommended change to super-tough Jewel Bondex Garnet Fibre. Builder reports, "These Jewel drum covers are the best ever!

Moisture repellent and heat resistant.

Whatever your product, chances are you can cut costs — do better work like this — with Jewel Coated Abrasives. See your distributor or write us now!

Abrasive Products, Inc.

SOUTH BRAINTREE 85, MASSACHUSETTS · MAKERS OF JEWEL COATED ABRASIVES

ABRASIVE PRODUCTS INC. JEWEL ABRASIVES SOUTH BRAINTREE, MASS. U.S.A.

There's a JEWEL ABRASIVE for Every Polishing and Finishing Need

BELTS
DISKS
SHEETS
SPECIAL SHAPES
Cloth, Paper, Fibre or Combination Backing

BUY THROUGH YOUR INDUSTRIAL DISTRIBUTOR

Grainlock Polishing Wheel Cement. Industrial Lubricants Co. Inc., 14459 Wildemere, Detroit 6, Mich., has available a brochure containing dozens of time and money-saving tips on setting up polishing wheels for long life and maximum efficiency.

Form Fitted Spray Mask Finishing. High production methods as applied to decorative finishing of plastics, metal stampings, and die castings is the subject of a six-page seven-color folder now being offered by Thierica Studio, 409 Henry Ave., S. E., Grand Rapids, Mich.

Folder No. SM-13 also contains full information for adapting this finishing method to various products, as well as a complete description of the five types of fitted masks that are commonly employed.

Details for ordering or for making further investigation of the process are included together with suggestions to consider when approving designs that are intended for high production practice.

Catalogs

FOR YOUR LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Polishing Wheel Cement

"Setting Up Polishing Wheels" is the title of a brochure prepared by Industrial Lubricants Co. Inc., Detroit, Mich., containing many tips on setting up polishing wheels with Grainlock polishing wheel cement for long life and maximum efficiency.

2. Precious Metal Plating

A 20-page booklet issued by A. Robinson & Son, New York 2, N. Y., presents in usable form accepted methods applied in the electroplating of such articles as watch cases, insignia, jewelry, novelties, pen and pencil parts.

3. Polishing Accessories

The Manderscheid Co., Chicago 7, Ill., has issued Bulletin 103 describing the Presto line of work holding spinners, tube polishing machines, emery troughs, wheel rakes, and other accessories.

4. Dust Collectors

Catalog No. 34, published by the Torit Mfg. Co., St. Paul, Minn., outlines methods for collecting and cleaning dust-laden air from around industrial machines and includes complete information on the Torit line of self-contained and cyclone type dust collectors.

5. Appli-Matic Bulletin

A bulletin describing the operation of Vander Wal-Wagner Appli-matics, mechanical buffing compound applicators, is available from Wagner Bros., Inc., Midland, Detroit 3, Mich. Use of the Appli-matics in manual and automatic polishing and buffing setups, as well as advantages of the units, is detailed in the bulletin.

6. Dulac Clear Lacquer

Technical Data Bulletin 110 describing Dulac Clear Universal Lacquer No. 462 is available from the Mass & Waldstein Co., Newark 4, New Jersey.

7. Industrial Chemicals

A bulletin issued by the Harshaw Chemical Co., Cleveland 6, Ohio, lists alphabetically the chemicals supplied by the company to industries such as electroplating, ceramics, scientific laboratories, and so on.

8. Water Wash Spray Booths

Specifications, construction features, line drawings, and photographs of Despatch Water Wash Spray Booths are included in Bulletin 66, published by the Despatch Oven Co., Minneapolis 14, Minnesota.

9. Emulsion Cleaner

Properties and operation of Ahcoloid Emulsion Cleaner are explained in detail in a booklet supplied by the Apothecaries Hall Co., Waterbury 88, Connecticut.

10. Conveyor Belts

A complete, basic reference on conveyor belts, designs, systems, and metallurgy is being offered by the Cambridge Wire Cloth Co., Cambridge, Maryland.

11. Flock Color Card

A color card illustrating 20 stock shades of flock in rayon, cotton, and wool can be obtained from the Claremont Waste Mfg. Co., Claremont, New Hampshire.

12. Portable Spray Unit

Complete information on the Binks DP ⅓ h.p. Portable Spray Unit, either electrically powered or gasoline engine driven, is contained in Bulletin 601, available from the Binks Mfg. Co., Chicago 12, Illinois.

13. Rotary Automatic Polishing and Buffing Machine

Bulletin No. 45, issued by Hammond Machinery Builders, Inc., Kalamazoo, Mich., includes illustrations, descriptions, and specifications of the Hammond "Super" Rotary Automatic for grinding, polishing, buffing, and deburring.

14. Cleaning Machinery

An illustrated folder descriptive of its complete line of machinery for washing, rinsing, and drying metal parts is now being offered by the Cincinnati Cleaning and Finishing Machinery Co., Ironton, Ohio.

15. Abrasive Belts

Thirteen production reports from various manufacturers citing advantages of Resinall Metalite Belts are contained in a folder issued by Behr-Manning, Troy, New York.

16. Vapor Degreasing

"Vapor Degreasing with Du Pont Non-Flammable Solvents" is a title of a book on practical metal cleaning being issued by E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Wilmington 98, Delaware. Information included in the book concerns the application of vapor degreasing to metal cleaning problems. The book is illustrated with application photographs showing vapor degreasing in various industries.

17. Phosphate Coating

The Neilson Chemical Co., Detroit 7, Mich., has issued Prep-N-Cote Bulletin 48-91, describing the application of Prep-N-Cote to the preparation of steel and aluminum for painting.

18. Infra-Red Ovens

Applications and advantages of Triangle Infra-Red Ovens are cited and illustrated in an eight-page catalog prepared by the Triangle Equipment Co., Inc., Nutley, New Jersey.

19. Abrasive Grains

The Exolon Co., Tonawanda, N. Y., has issued a folder describing Exolon abrasive grains and polishing procedures applicable to various industry groups.

20. Nickel Plating

"Practical Nickel Plating" is the title of a comprehensive booklet issued by the International Nickel Co., New York 5, N. Y., which contains a summary of information on industrial nickel plating, including solution compositions, operating conditions, process cycles, cause and correction of plating difficulties, and solution purification methods.

21. Organic Finishing

A 12-page technical bulletin outlining basic points to be considered in the planning of a complete organic finishing system has been prepared by Peters-Dalton, Inc., Detroit 12, Michigan.

22. Cleaners and Paint Strippers

Six technical bulletins describing paint strippers, cleaners, and phosphate coating materials are being distributed by Chemco Products Co., Inc., Chicago 19, Illinois.

23. A.C. Generators

A bulletin describing the construction and operation of Columbia alternating current generators is being issued by the Columbia Electric Manufacturing Co., Cleveland 14, Ohio.

24. Clear Lacquer

Stanley No. 45X-70 Clear Gloss Synthetic, a water-white coating for silver, or brass, chromium, steel, iron, magnesium, and zinc, is described in a data sheet available from The Stanley Chemical Co., East Berlin, Connecticut.

25. Abrasive Belt Head

Bulletin No. 17 issued by The Packer Machine Co., Meriden, Conn., describes Model No. 18 universal abrasive belt head and contains suggested applications of the device.

26. Polishing Wheels and Belts

"Setting Up Metal Polishing Wheels and Belts" is the title of a 44-page handbook obtainable from the Norton Co., Worcester 6, Mass., which contains many worthwhile tips for increasing production and cutting polishing costs.

27. Uses for Paint Finishes

The National Paint, Varnish and Lacquer Association, Inc., Washington, D.C., has available an eight-page pamphlet entitled "Where Isn't A Finish."

28. Baking and Drying Ovens

Both batch and conveyor type baking and drying ovens are the subject of Bulletin 5 issued by the Young Brothers Co., Cleveland, Ohio.

29. Finishing Equipment

J. Holland & Sons, Inc., Brooklyn, N. Y., has published Folder "M" describing finishing equipment furnished by the company.

30. Burnishing Materials

The Abbott Ball Co., Hartford 10, Conn., has prepared data and charts illustrating and describing its line of burnishing materials.

PRODUCTS FINISHING
431 Main St., Cincinnati 2, Ohio

I am interested in receiving the following literature reviewed in your July Issue.

No...... **No.**..... **No.**..... .... **No.**..... **No.**.....
(Insert numbers denoting literature you want)

Name ..... **Title**.....

Company ....

Company Address .....

City .... **State**.....

Please print plainly in filling out coupon for literature.

Index to Advertisements

Abbott Ball Co. 77
Abrasive Products, Inc. 109
Allied Research Products, Inc. 73
American Brake Shoe Co., Kellogg Div. 38, 39
American Chemical Paint Co. 51
Amersil Co., Inc. 82
Automotive Rubber Co. 35

Baker & Co., Inc. 2
Baughn Chemical Products Co. 80
Bede Products, Inc. 65
Better Finishes & Coatings, Inc. 99
Binks Mfg. Co. 26, 27
Blakeslee & Co., G. S. 4

Cambridge Wire Cloth Co. 57
Chemco Products Co., Inc. 84
Chemsteel Construction Co., Inc. 101
Cincinnati Cleaning & Finishing Mchry. Co. ..... Second Cover
Circo Products Co. 33
Claremont Waste Mfg. Co. 8
Codman Co., F. L. & J. C. 75
Cowles Chemical Co. 10

Davis-K-Products Co. 104
Detrex Corp. ..... Fourth Cover
Detro Mfg. & Sales Co., Inc. 98
Dixon & Rippel, Inc. 100

Gardner Laboratory, Inc., Henry A. 101

Hanson-Van Winkle-Munning Co. 3
Harrison & Co., Inc. 105
Hercules Powder Co. 76
Holland & Sons, Inc., J. 60
Hygrade Food Products Corp., Boothcote Div. 72

Industrial Filter & Pump Mfg. Co. 103
Industrial Lubricants Co., Inc. 97
International Nickel Co., Inc. 6, 7, 61

Jackson Buff Corp. ..... Between Pages 56-57
Jensen Specialties, Inc. 59

Kalamazoo Tank & Silo Co. 92
Keystone Emery Mills 102
Kirk & Blum Mfg. Co. 25
Kirker Chemical Co. 71
Kold-Hold Mfg. Co. 95

MacDermid, Inc. ..... Third Cover
Mahon Co., R. C. 46, 47
Miracle Paint Rejuvenator Co., Inc. 102
Morse Mfg. Co., Inc. 104
Murray-Way Corp. 93

Neilson Chemical Co. 9

Oakite Products, Inc. 1

Packer Machine Co. ..... Between Pages 56-57
Parker Rust Proof Co. 56
Peters-Dalton, Inc. 69
Pittsburgh Plate Glass Co., Paint Div. 36, 37
Pratt & Lambert, Inc. 53
Prozite Co. 94

Randolph Products Co. 54
Rinshed-Mason Co. 63

Schaffner Mfg. Co. 72
Sherwin-Williams Co. 48, 49
Solvents Recovery Service, Inc. 106
Speare's Sons Co., Alden 100
Stanley Chemical Co. ..... Between Pages 56-57
Stevens, Inc., Frederic B., Div. of Udylite Corp. 55
Striplastic Co. 58
Sulphur Products Co. 106
Surety Rubber Co. 52

Udylite Corp. 67

Vonnegut Moulder Corp. 96

Young Bros. Co. 101

BACKGROUND MEANS QUALITY

For over twenty-five years MAC DERMID INCORPORATED has manufactured and supplied outstanding compounds and processes to the metal finishing and cleaning industry. This twenty-five year background assures not only know how and service, but proven quality. Knowing the value of service MAC DERMID INCORPORATED has technical representatives in strategic cities through the United States to be consulted when a specific compound is needed for a specific problem.

CHROMETEX — New, fast acting, more positive *Nickel Activator* used to increase the covering power of chrome — eliminates grey streaks and clouds and or reduces passive nickel.

METEX — A series of individually formulated compounds for specific cleaning operations.

ROCHELTEX — A new *Copper Addition Agent* that can be added to any cyanide copper plating solution — can cut cyanide consumption up to 50% — increases cathode efficiencies by at least 20% — carbonate buildup may be completely eliminated.

DYCLENE E — Efficient and economical improved compound for electro-cleaning die cast materials — Thoroughly activates surfaces — eliminates gas absorption.

THE ALUMETEX PROCESS — New improved process for electro-plating on aluminum.

ANODEX — Reverse current process for electro-cleaning ferrous metals.

METALEX — For cleaning in tumbling barrels or as a soak or electro-cleaner.

METEX ZINC STRIPPER — Fast acting alkaline solution for stripping zinc.

Send For Free Data Sheets Or Sample Order

MAC DERMID
★ *Incorporated* ★
WATERBURY 20, CONNECTICUT

COMPLETE SUPPLIERS TO THE METAL FINISHING INDUSTRY

This Purchasing Agent at an Aircraft Plant

KEEPS OUT OF TROUBLE

because he buys DETREX solvents

This purchasing agent has found it "smart" to buy degreasing solvents that are *right* for his company's particular jobs.

For example, he uses premium grade PERM-A-CLOR for cleaning white metals—aluminum and zinc die castings. He also uses it in those degreasers where mixtures of various kinds of metals are cleaned, and where operating conditions and soil are too severe for any but the BEST solvent.

And in those machines cleaning only ferrous metals, he uses the lower-priced TRIAD solvent. Both Triad and Perm-A-Clor have superior oil and grease removing ability, but Perm-A-Clor is the most stable degreasing solvent on the market.

Knowing that Detrex originated stabilized solvents for degreasing, provides unequalled service, and makes prompt delivery from 150 warehouses throughout the country . . . this purchasing agent is always sure of his cleaning.

Let Detrex analyze your cleaning operations—no obligation.

Production Superintendent

"Gets production-line cleaning with Detrex metal parts washers."

Plating Superintendent

"Cuts costs with Detrex metal-cleaning compounds."

General Manager

"Saves time with Detrex degreasers."

DETREX DETROIT, MICH.

DETREX Corporation

BOX 501, DETROIT 32, MICHIGAN